

# Roland®





V-MIXING PROCESSOR

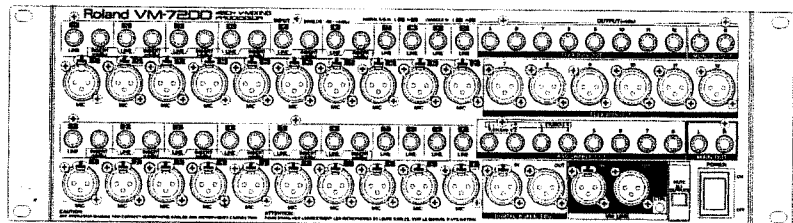
# VM-7200 VM-7100

## OWNER'S MANUAL

Thank you, and congratulations on your choice of the Roland **VM-7200 (VM-7100) V-Mixing Processor**.

Before using this unit, carefully read the sections entitled: "IMPORTANT SAFETY INSTRUCTIONS" (p. 2), "USING THE UNIT SAFELY" (p. 3), and "IMPORTANT NOTES" (p. 6). These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, Owner's Manual should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.

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### How to Read this Manual

This Owner's Manual was prepared so that it could be used for either of the two models below. Consult this manual after confirming which model you are using.



48 Channel V-Mixing Processor: VM-7200  
38 Channel V-Mixing Processor: VM-7100

The VM-7200 (VM-7100) is designed to be used together with Roland's VM-C7200 (VM-C7200) V-Mixing Console. The explanations and descriptions in this Owner's Manual deal mainly with the initial setup, including connecting the VM-7200 with other devices and powering up. For information on operational procedures, refer to the VM-C7200 (VM-C7200) Owner's Manual.

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Roland International Website <http://www.rolandcorp.com/>  
Roland US Website <http://www.rolandus.com/>

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
<b>ATTENTION:</b> RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIIR		
<p><b>CAUTION:</b> TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

## IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

**WARNING** - When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.
2. Do not use this product near water — for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
3. This product should be used only with a cart or stand that is recommended by the manufacturer.
4. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
5. The product should be located so that its location or position does not interfere with its proper ventilation.
6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.
7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
8. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.
9. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
10. The product should be serviced by qualified service personnel when:
  - A. The power-supply cord or the plug has been damaged; or
  - B. Objects have fallen, or liquid has been spilled into the product; or
  - C. The product has been exposed to rain; or
  - D. The product does not appear to operate normally or exhibits a marked change in performance; or
  - E. The product has been dropped, or the enclosure damaged.
11. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

For the USA

### GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.


This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**DANGER:** Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

For the U.K.

**WARNING:** THIS APPARATUS MUST BE EARTHED  
**IMPORTANT:** THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.  
GREEN-AND-YELLOW: EARTH, BLUE: NEUTRAL, BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  or coloured GREEN or GREEN-AND-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

The product which is equipped with a THREE WIRE GROUNDING TYPE LINE PLUG must be grounded.




# USING THE UNIT SAFELY

## INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

### About ⚠ WARNING and ⚠ CAUTION Notices


<b>⚠ WARNING</b>	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
<b>⚠ CAUTION</b>	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

### About the Symbols


	The ⚠ symbol alerts the user to important instructions or warnings. The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
	The ⓧ symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
	The ● symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

### ALWAYS OBSERVE THE FOLLOWING


#### ⚠ WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual. 


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- Do not open or perform any internal modifications on the unit. (The only exception would be where this manual provides specific instructions which should be followed in order to put in place user-installable options; see p. 13, 14, 16, 18, 19, 21.) 


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- Make sure you always have the unit placed so it is level and sure to remain stable. Never place it on stands that could wobble, or on inclined surfaces. 


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- Avoid damaging the power cord. Do not bend it excessively, step on it, place heavy objects on it, etc. A damaged cord can easily become a shock or fire hazard. Never use a power cord after it has been damaged. 

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- In households with small children, an adult should provide supervision until the child is capable of following all the rules essential for the safe operation of the unit. 

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- Protect the unit from strong impact. (Do not drop it!) 

- Do not force the unit's power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord's outlet must never exceed the power rating (watts/ amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through. 









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- Before using the unit in a foreign country, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page. 

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- Always turn the unit off and unplug the power cord before attempting installation of the circuit board (model no. VS8F-2, VM-24E, VM-24C; p. 26). 

**CAUTION**

- Always grasp only the plug on the power-supply cord when plugging into, or unplugging from, an outlet or this unit. 
- Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children. 
- Never climb on top of, nor place heavy objects on the unit. 
- Never handle the power cord or its plugs with wet hands when plugging into, or unplugging from, an outlet or this unit. 
- Before moving the unit, disconnect the power plug from the outlet, and pull out all cords from external devices. 
- Before cleaning the unit, turn off the power and unplug the power cord from the outlet (p. 26). 
- Whenever you suspect the possibility of lightning in your area, pull the plug on the power cord out of the outlet. 
- Install only the specified circuit board(s) (model no. VS8F-2, VM-24E, VM-24C). Remove only the specified screws (p. 13, 14, 16, 18, 19, 21). 



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# IMPORTANT NOTES

In addition to the items listed under "IMPORTANT SAFETY INSTRUCTIONS" and "USING THE UNIT SAFELY" on pages 2 and 3, please read and observe the following:

## Power Supply

- Do not use this unit on the same power circuit with any device that will generate line noise (such as an electric motor or variable lighting system).
- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to speakers or other devices.

## Placement

- Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum. To alleviate the problem, change the orientation of this unit; or move it farther away from the source of interference.
- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.
- To avoid possible breakdown, do not use the unit in a wet area, such as an area exposed to rain or other moisture.

## Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.
- Never use benzine, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

## Additional Precautions

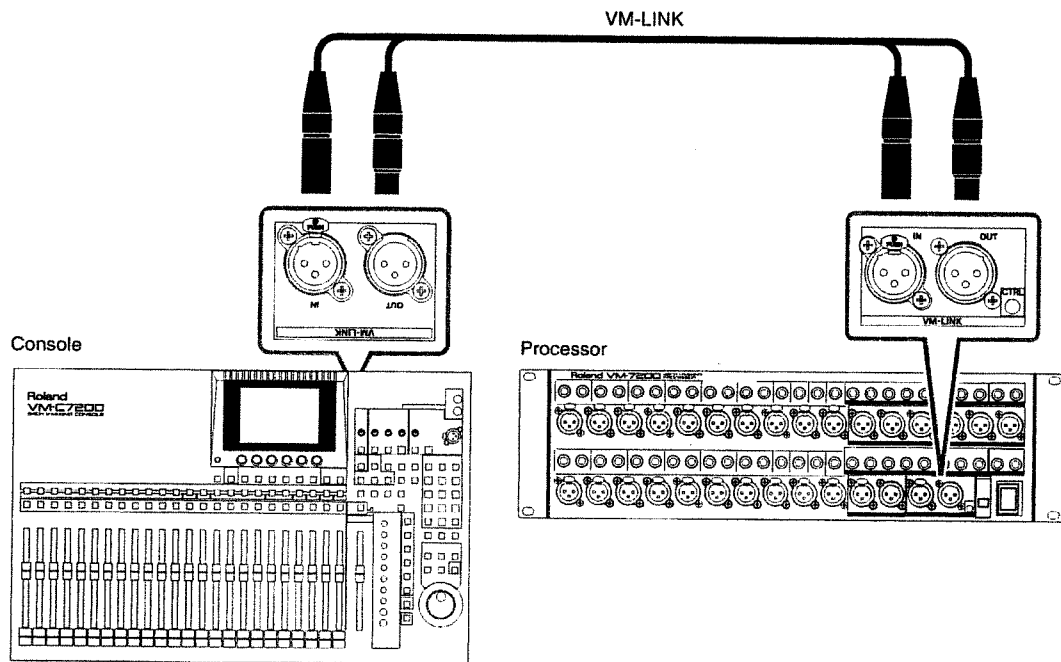
- Use a reasonable amount of care when using the unit's buttons, sliders, or other controls; and when using its jacks and connectors. Rough handling can lead to malfunctions.
- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable's internal elements.

- A small amount of heat will radiate from the unit during normal operation.
- To avoid disturbing your neighbors, try to keep the unit's volume at reasonable levels. You may prefer to use headphones, so you do not need to be concerned about those around you (especially when it is late at night).
- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.
- Use a cable from Roland to make the connection. If using some other make of connection cable, please note the following precautions.
  - Some connection cables contain resistors. Do not use cables that incorporate resistors for connecting to this unit. The use of such cables can cause the sound level to be extremely low, or impossible to hear. For information on cable specifications, contact the manufacturer of the cable.

# Main Features

## Revolutionary Design Concept (Separate Systems)

Roland's VM-7000 Series V-Mixing System adopts the concept of **separate systems** in which the input/output section (the processor), and the operating section (the console) are completely separate.



The processor and console are connected by two standard AES/EBU digital audio cables (VM-Link). Only data concerned with the console's operations is sent to the processor. No audio signals are exchanged between the two devices, thus eliminating talkback and other problems. Because of this, **you can easily put together a PA system that is very resistant to noise.**

## A Full Array of Input and Output Connectors

The processor is equipped with a variety of connectors, including XLR connectors compatible with a range of levels, from mic to line, quarter-inch phone jacks (balanced and unbalanced), and digital interfaces (S/P DIF coaxial and AES/EBU) for connecting numerous kinds of digital devices, from consumer electronics to professional equipment. **All provide you with professional-quality processing.**

## Up to Nine Stereo Effects Groups (With VS8F-2 Installed)

These processors come with two 24-bit stereo digital effects groups (compatible with Roland's VS8F-2). This allows you to instantly call up algorithms for the reverb and compression effects, mic simulator, speaker modeling, and other effects that are so popular in Roland's VS-1680 Digital Studio Workstation and VM-3100 V-Mixing Station. Furthermore, there is an additional group of **Master-only stereo effects** that can be inserted only in the MASTER OUT/MONITOR OUT. And what's more, since up to three VS8F-2 Effects Expansion Boards can be installed, this **lets you use up to an astounding nine stereo effects.**

## Main Features

### Routing Freedom

Previous mixers have had a fixed number of buses, a fact which has placed limitations on the applications they could be used for, and the addition of peripheral devices. With the VM-7200's **FlexBus**, this limitation is a thing of the past, providing you with complete freedom to set up the routings most suitable for the purpose at hand. In addition, the processor features a **virtual patchbay** that allows you to freely change input and output channel connections—without having to change any cables.

### Equipped With Spectrum Analyzer

The VM-7200 also features a **spectrum analyzer** that lets you check the acoustic properties at live venues, such as clubs and concert halls. It features a built-in noise generator and oscillator, so you can view the acoustic characteristics in the console display, allowing you to make the perfect adjustments (with the equalizer settings) rapidly and efficiently.

### ■ Differences Between the VM-7200 and VM-7100

The numbers of input and output jacks provided on the VM-7200 and VM-7100 differ as shown below. Check which model you are using to avoid confusion.

#### Analog Input Jacks

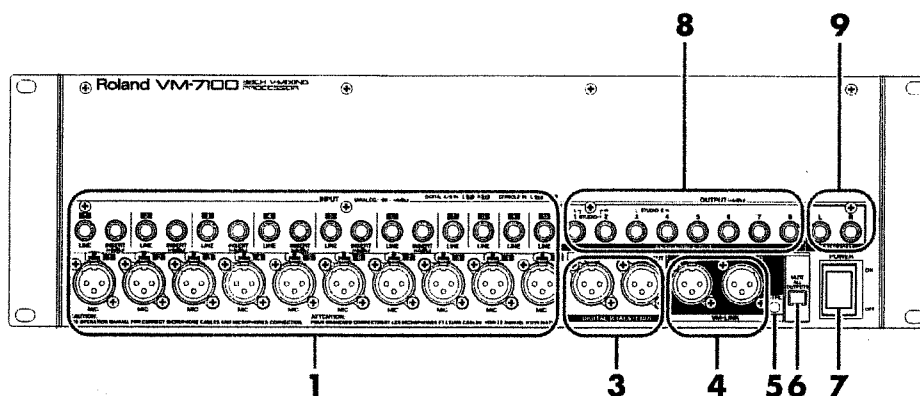
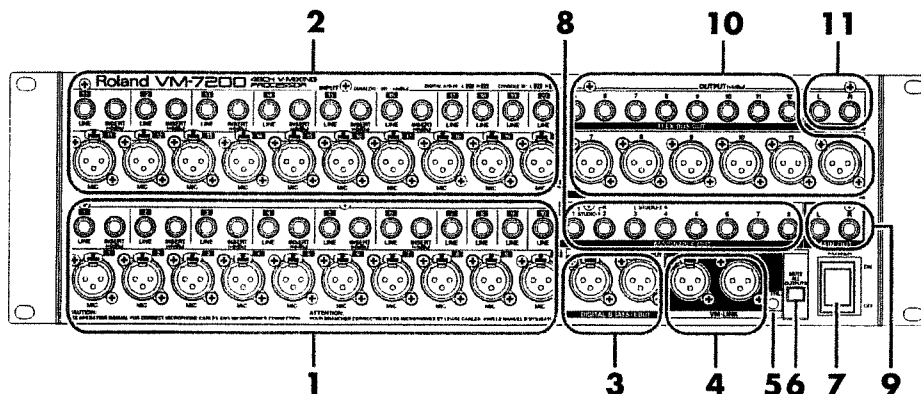
VM-7200: 20 (ch.1–ch.20)  
VM-7100: 10 (ch.1–ch.10)

#### Analog Output Jacks

VM-7200: 22 (MAIN OUT L/R, REC OUT L/R, MONITOR OUT L/R, FLEX BUS OUT 5–12, ASSIGNABLE OUT 1–8)  
VM-7100: 12 (MAIN OUT L/R, REC OUT L/R, ASSIGNABLE OUT 1–8)

# Front and Rear Panels

## Front Panel



### 1 INPUT 1-10

These are connectors for inputting analog audio signals to Channels 1-10. Connect microphones, instruments, or other such equipment to these inputs (p. 27).

Microphones or other devices connected to the MIC connectors (XLR type) can be supplied with electrical power at 48 volts DC (phantom power).

**LINE:** Used for connecting instruments and similar equipment (1/4" phone, balanced or unbalanced)

**MIC:** Used for connecting microphones and instruments with balanced output (XLR type).

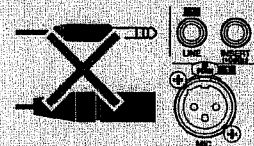
**INSERT:** Used for inserting effects from external effects devices and similar equipment into the inputs of Channels 1-6 (1/4" phone, TRS).

### 2 INPUT 11-20

These are connectors for inputting analog audio signals to Channels 11-20. Only the VM-7200 is so equipped. Use just as you would INPUT 1-10.



Do not have plugs connected to both the MIC connector and LINE jack inputs for the same channel simultaneously. Select one or the other for use.



## Front and Rear Panels

### 3 DIGITAL B (AES/EBU)

These are XLR-type digital audio input/output connectors. Use for connecting professional digital devices and similar equipment (p. 29). **These cannot be used for inputting and outputting analog audio signals.**

**IN:** Used for inputting digital audio signals. **DIGITAL B IN cannot be used when DIGITAL A IN is in use.**

**OUT:** Used for outputting digital audio signals. Select the audio signals to be output in the console's patch bay (refer to the console Owner's Manual).

### 4 VM-LINK

These are connectors used for inputting and outputting the mixing processor's control signals (VM-LINK). These connect to the mixing console (p. 23).

### 5 CTRL (Control)

This lights in green when the power is on. When VM-LINK data is being transmitted between the processor and the mixing console, it flashes in green.

### 6 MUTE ALL OUTPUTS

Sound is prevented from being sent from all output connectors while the button is held down (the sound is muted). Press this to prevent noise while inserting or pulling out plugs (p. 25).

### 7 POWER

This turns the power for the mixing console on and off.

### 8 ASSIGNABLE OUT

These are analog audio output jacks (1/4" phone, balanced/unbalanced). These output the same sounds as those output from MULTI OUT 17-24 (R-BUS (RMDB2)).

### 9 MAIN OUT

These are connected to power amps and main speakers. These output the same sounds as those output from MAIN OUT on the rear panel.

### 10 FLEX BUS OUT

These are analog audio output connectors and jacks assigned to the FLEX BUS (1/4" phone, balanced/unbalanced; XLR type, balanced). Connect monitor speakers and similar equipment to these connectors.

### 11 MONITOR OUT

These are connected to power amps and monitor speakers. Only the VM-7200 is so equipped.

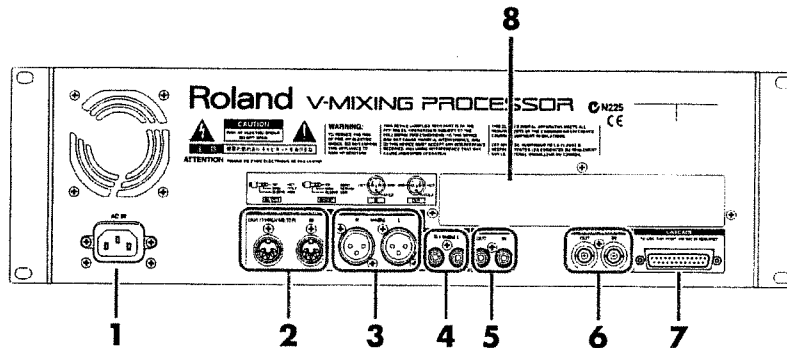
#### NOTE

The red **CTRL** indicator light indicates a problem in transmitting VM-LINK data. Check the connection between the processor and the console.

#### MEMO

When the Bus mode is set to **INT**, the signals on FlexBuses 1-8 (5-8) are not output from FLEX BUS OUT (although you can output the signals from MASTER OUT and other outputs). Refer to the console Owner's Manual.

## Rear Panel



### 1 AC IN

Connect the power cord included with the processor.

### 2 MIDI/METER BRIDGE

Use these for connecting Roland's MB-24 Meter Bridge, external MIDI devices (MIDI controllers) and other devices.

**OUT/THRU/METER:** Use as a MIDI OUT or MIDI THRU connector. Ordinarily, the MB-24 is connected.

**IN:** MIDI messages are received here. Connect to the MIDI OUT connector of an external MIDI device.

### 3 MAIN OUT

These are connected to power amps and main speakers. These output the same sounds as those output from MAIN OUT on the front panel.

### 4 REC OUT

Usually a master recorder or consumer audio device (such as a radio cassette recorder) is connected here.

### 5 DIGITAL A

These are coaxial type digital audio input/output connectors. Use for MD recorders or DAT recorders (p. 29). **These cannot be used for inputting and outputting analog audio signals.**

**IN:** Used for inputting digital audio signals. **DIGITAL A IN cannot be used when DIGITAL B IN is in use.**

**OUT:** Used for outputting digital audio signals. Select the audio signals to be output in the console's patch bay (refer to the console Owner's Manual).

### 6 WORD CLOCK

These are connectors for input and output of the word clock used for synchronizing external digital devices (BNC type) (p. 33).

**IN:** For inputting word clock.

**OUT:** For outputting word clock.



Do not connect using any power cord other than the one provided. Using any other power cord may result in damage to the equipment.



Terminator settings are required when word clock is used. Refer to the console Owner's Manual.



## Front and Rear Panels

### 7 CASCADE

These are connectors used for a cascade connection of two mixing consoles (p. 32).

### 8 Rear Cover

A separately sold I/O expansion board **VM-24E** can be installed here (p. 14, 19)

#### NOTE

In order to use the **CASCADE** connector, you must obtain the optional **Roland Cascade Kit VM-24C**.

**VM-24C** includes two boards, a **MASTER** and a **SLAVE**. Install the **MASTER** board in one of the processors, and the **SLAVE** board in the other processor (p. 16, 21).



# Installing Optional Devices

## Cautions Concerning Installation of Optional Devices

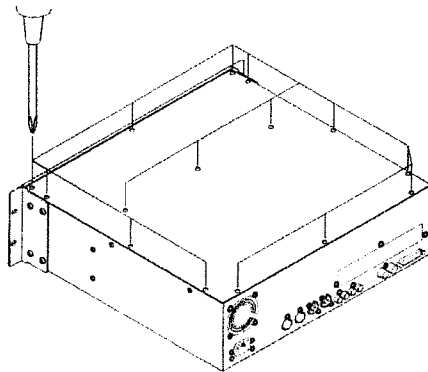
- Always turn the unit off and unplug the power cord before attempting installation of the circuit board (model no. VS8F-2, VM-24C, VM-24E; p. 26).
- Install only the specified circuit board(s) (model no. VS8F-2, VM-24C, VM-24E). Remove only the specified screws (p. 13, 14, 16, 18, 19, 21).
- To avoid the risk of damage to internal components that can be caused by static electricity, please carefully observe the following whenever you handle the board.
  - Before you touch the board, always first grasp a metal object (such as a water pipe), so you are sure that any static electricity you might have been carrying has been discharged.
  - When handling the board, grasp it only by its edges. Avoid touching any of the electronic components or connectors.
- Use a Phillips screwdriver of a size appropriate for the head of the screw (a no.2 screwdriver). If the screwdriver is the wrong size, the screw heads may be stripped, or you may not be able to turn the screws.
- To remove the screws, rotate the screwdriver counterclockwise. To tighten the screws, rotate the screwdriver clockwise.
- Take care not to drop any screws into the interior of the VM-7000 series' chassis.
- Do not touch any of the printed circuit pathways or connection terminals.
- Never use excessive force when installing a circuit board. If it doesn't fit properly on the first attempt, remove the board and try again.
- When circuit board installation is complete, double-check your work.



## Installing Effects Processors (VS8F-2)

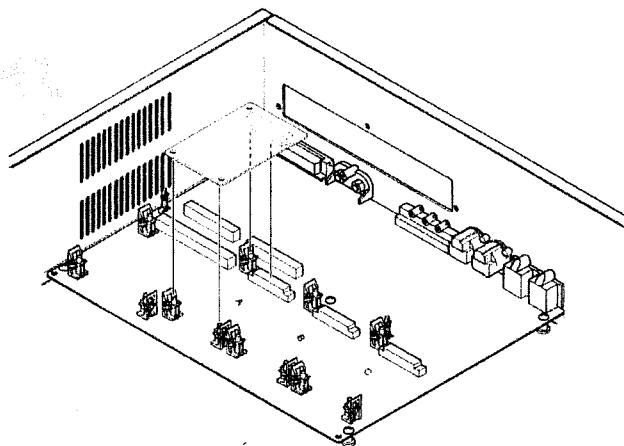
The VM-7000 series comes with two onboard stereo effects processors. If you wish to add more effects, Roland offers the **VS8F-2** Effects Expansion Board, available for separate purchase. Up to three of these effects expansion boards can be installed in the VM-7000 series. If VS8F-2 boards are installed, you can use a maximum of nine stereo effects on the VM-7000 series without using any external equipment. Roland recommends that you install one or more VS8F-2 boards.

- 1 Turn off the power on all equipment, and disconnect all cables from the VM-7000 series unit.
- 2 Remove only the screws specified in the following diagram, and detach the top panel of the VM-7000 series unit.



## Installing Optional Devices

- 3 There are three connectors and nine plastic pins inside. Insert the VS8F-2 connector into the internal connector, and at the same time, insert the plastic pins into the holes of the VS8F-2 to firmly fix it in place.

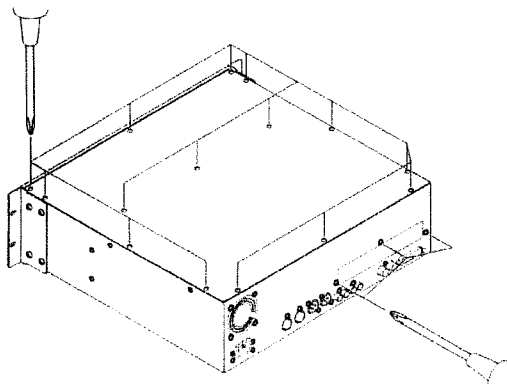


- 4 Using the (specified) screws you removed in step 2, reattach the top panel.
- 5 This completes installation of the VS8F-2.

## Installing R-BUS (RMDB2) Connectors (VM-24E)

Roland also makes available the **VM-24E** I/O Expansion Board, which can be purchased separately. When the VM-24E is installed, you can add three R-BUS (RMDB2) connectors. By connecting a Roland DIF-AT, you can exchange 8-in/8-out 24-bit digital audio signals with a digital multitrack recorder, such as the ALESIS adat or the TASCAM DA-88 (maximum of three recorders). Roland recommends that you install the VM-24E.

- 1 Turn off the power on all equipment, and disconnect all cables from the VM-7000 series unit.
- 2 Remove only the screws specified in the following diagram, and remove the top panel and rear cover of the VM-7000 series unit.



### NOTE

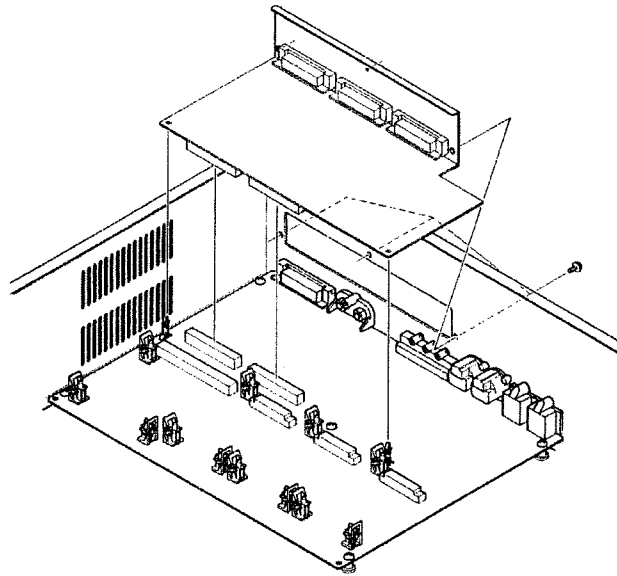
If you are installing only one VS8F-2, connect it at EFFECT A. If you are installing two VS8F-2 boards, connect them at EFFECT A and EFFECT B.

### MEMO

R-BUS, RMDB2 and RMDB II are the same standard of Roland.

## Installing Optional Devices

- 3 Insert the VM-24E connector into the internal connector, and simultaneously insert the plastic pins into the holes of the VM-24E to fasten it in place.



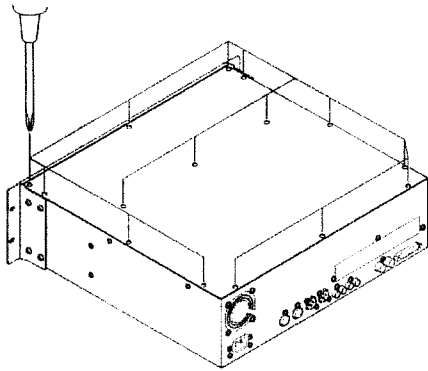
- 4 Using the (specified) screws that you removed in step 2, attach the VM-24E to the rear panel. Keep the rear cover in a safe place.
- 5 Using the (specified) screws you removed in step 2, reattach the top panel.
- 6 This completes installation of the VM-24E.

## Installing Optional Devices

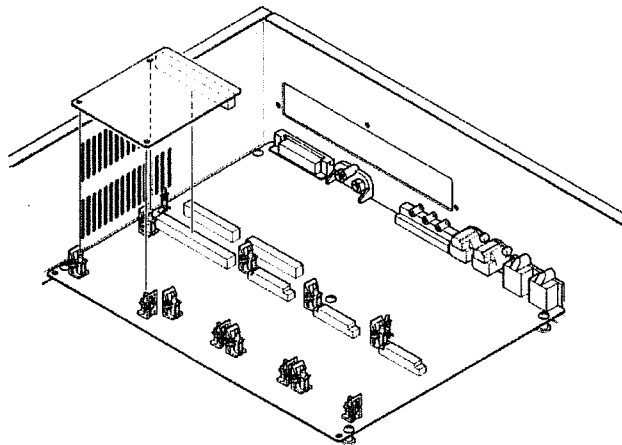
### Installing the Cascade Kit (VM-24C)

Roland also offers the **VM-24C** Cascade Kit, available for separate purchase. Once the VM-24C is installed, you will be able to use the CASCADE connector. By cascading two VM-7000 series units, a maximum of 94 input channels can be supported (when the VM-24E and DIF-AT are used). Roland recommends that you install the VM-24C.

- 1 Turn off the power on all equipment, and disconnect all cables from the VM-7000 series unit.
- 2 Remove only the screws specified in the following diagram, and detach the top panel of the VM-7000 series unit.



- 3 Insert the VM-24C connector into the internal connector, and simultaneously insert the plastic pins into the holes of the VM-24C to fasten it in place.



- 4 Using the (specified) screws you removed in step 2, reattach the top panel.
- 5 This completes installation of the VM-24C.



The VM-24C includes two boards, a **MASTER** and a **SLAVE**. Install the **MASTER** board in one of the processors and the **SLAVE** board in the other processor.

**The CASCADE connectors cannot be used unless both boards are installed. (p. 32)**

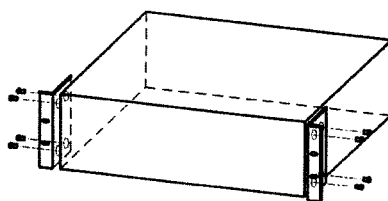


The processor which includes the **SLAVE** board of the VM-24C cascade kit does not work as a master unit in the single processor configuration. (p. 32)  
If you wish, please take the **SLAVE** board off the processor.

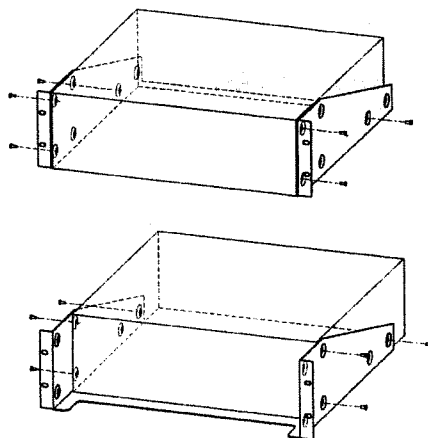
## Changing the Rack-mount Hardware (RO-7000)

The VM-7000 series comes with pre-installed rack-mount brackets that allow the unit to be mounted in a system rack. As a separately sold option, a different set of rack-mount brackets — the **RO-7000** — is available for purchase. When the RO-7000 is installed, the VM-7000 series will be positioned slightly backward (away from yourself) in the rack. This way, cable connectors that are plugged into the front panel jacks will not be in the way.

- 1 Turn off the power on all equipment, and disconnect all cables from the VM-7000 series unit.
- 2 Remove only the screws shown in the following diagram, and detach the rack-mount brackets that came with your VM-7000 series unit.



- 3 Using the (specified) screws that you removed in step 2, attach the RO-7000.



- 4 This completes installation of the RO-7000.

### MEMO

There are two ways to attach the RO-7000. Use the method suitable for your needs.

# Installation de dispositifs optionnels

## Précautions à prendre lors de l'installation de dispositifs optionnels

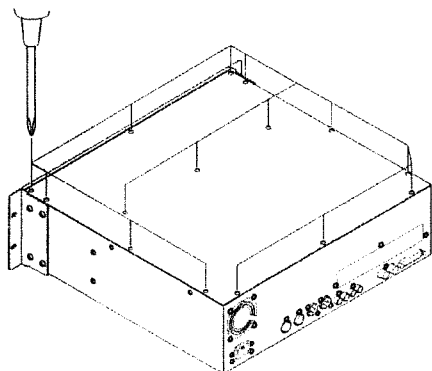
- Toujours éteindre et débrancher l'appareil avant de commencer l'installation de la carte. (modèle no VS8F-1, VM-24E, VM-24C; p. 26).
- N'installez que les cartes de circuits imprimés spécifiées (modèle no VS8F-2, VM-24E, VM-24C). Enlevez seulement les vis indiquées (p. 13, 14, 16, 18, 19, 21).
- Veuillez suivre attentivement les instructions suivantes quand vous manipulez la carte afin d'éviter tout risque d'endommagement des pièces internes par l'électricité statique.
  - Toujours toucher un objet métallique relié à la terre (comme un tuyau par exemple) avant de manipuler la carte pour vous décharger de l'électricité statique que vous auriez pu accumuler.
  - Lorsque vous manipulez la carte, la tenir par les côtés. Évitez de toucher aux composants ou aux connecteurs.
- Utiliser un tournevis cruciforme correspondant à la taille de la vis (un tournevis numéro 2). En cas d'utilisation d'un tournevis inapproprié, la tête de la vis pourrait être endommagée.
- Pour enlever les vis, tourner le tournevis dans le sens contraire des aiguilles d'une montre. Pour resserrer, tourner dans le sens des aiguilles d'une montre.
- Veillez à ne pas laisser tomber de vis dans le châssis du VM-7000.
- Ne pas toucher aux circuits imprimés ou aux connecteurs.
- Ne jamais forcer lors de l'installation de la carte de circuits imprimés. Si la carte s'ajuste mal au premier essai, enlevez la carte et recommencez l'installation.
- Quand l'installation de la carte de circuits imprimés est terminée, revérifiez si tout est bien installé.



## Installation d'un processeur à effet (VS8F-2)

La série VM-7000 possède deux processeurs à effet stéréo. Si vous désirez ajouter plus d'effets, Roland propose séparément la carte d'extension à effet **VS8F-2**. Jusqu'à trois de ces cartes peuvent être installées dans le VM-7000. Si des cartes VS8F-2 sont installées, vous pouvez utiliser un maximum de huit effets stéréo sur le VM-7000 sans vous servir d'aucun équipement externe. Roland vous recommande d'installer une ou plusieurs cartes VS8F-2.

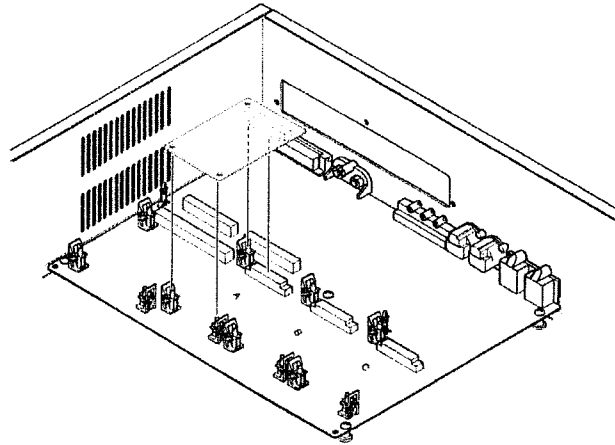
- 1 Éteindre l'appareil et déconnecter tous les câbles du VM-7000.
- 2 N'enlever que les vis spécifiées sur le schéma suivant et détacher la plaque du dessus du VM-7000.





## Installation de dispositifs optionnels

- Il y a trois connecteurs et neuf broches en plastique à l'intérieur. Insérer simultanément le connecteur du VS8F-2 dans le connecteur interne et les broches en plastique dans les trous du VS8F-2 pour le fixer fermement.

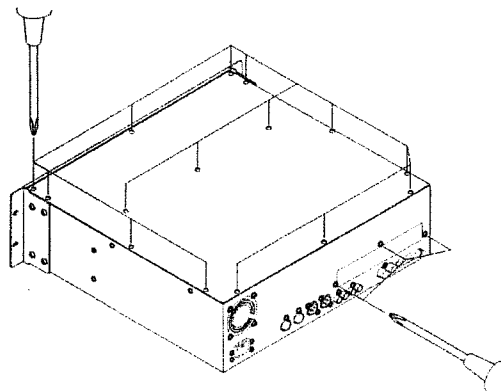


- Utiliser les vis enlevées à l'étape 2 pour fixer à nouveau la plaque du dessus.
- Ceci complète l'installation du VS8F-2.

### Installation d'un connecteur (VM-24E) R-BUS (RMDB2)

Roland propose aussi une carte d'extension **VM-24E I/O** que vous pouvez acheter séparément. Quand le VM-24E est installé, vous pouvez ajouter trois connecteurs R-BUS (RMDB2). En connectant le DIF-AT Roland, vous pouvez échanger des signaux audio numériques 24 bit 8 entrées/8 sorties avec un enregistreur digital multi-pistes comme le ALESIS adat ou le TASCAM DA-88 (maximum de 3 enregistreurs). Roland vous recommande d'installer le VM-24E.

- Éteindre l'appareil et déconnecter tous les câbles du VM-7000.
- N'enlever que les vis spécifiées sur le schéma suivant et détacher la plaque du dessus et la plaque arrière du VM-7000.

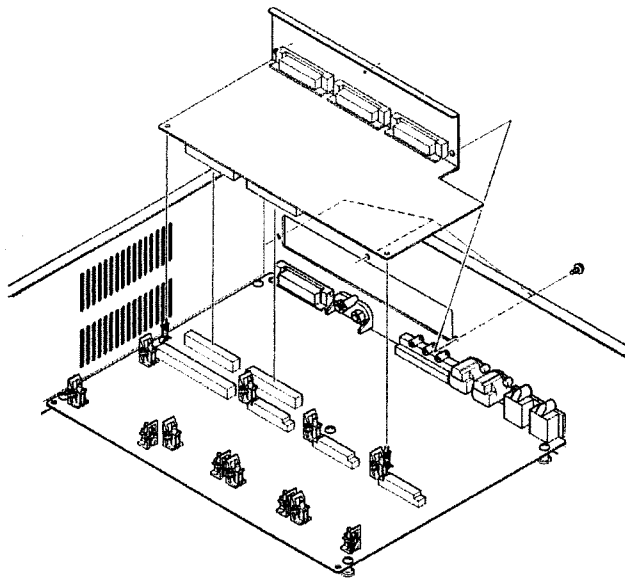


#### NOTE

Si vous installez seulement une carte VS8F-2, la connecter à EFFET A. Si vous installez deux cartes VS8F-2, les connecter à EFFET A et EFFET B.

## Installation de dispositifs optionnels

- 3 Insérer simultanément le connecteur du VM-24E dans le connecteur interne et les broches en plastique dans les trous du VM-24E pour le fixer fermement.



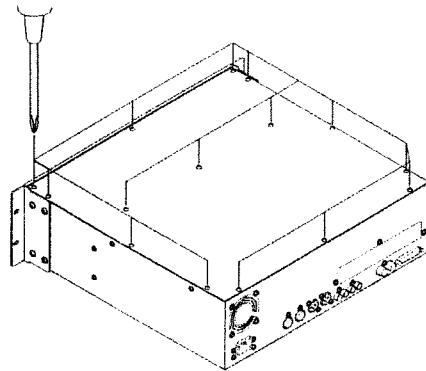
- 4 Utiliser les vis enlevées à l'étape 2 et fixer le VM-24E à la plaque arrière. Conserver la plaque arrière dans un endroit sûr.
- 5 Utiliser les vis enlevées à l'étape 2 pour fixer à nouveau la plaque du dessus.
- 6 Ceci complète l'installation du VM-24E.



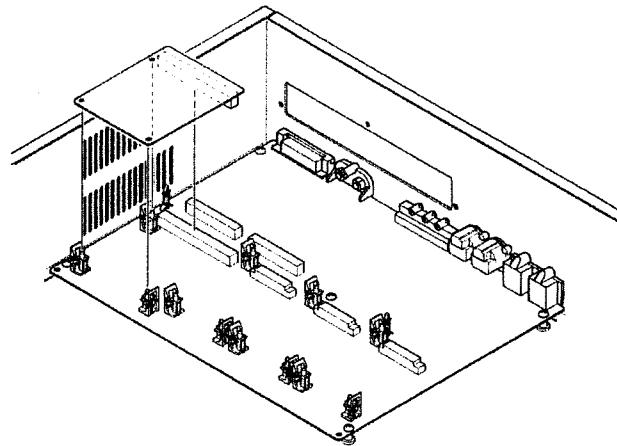
## Installation d'un kit Cascade (VM-24C)

Roland propose aussi séparément le kit Cascade (VM-24C). Une fois le VM-24C installé, vous serez en mesure d'utiliser le connecteur CASCADE. En connectant en cascade deux unités de la série VM-7000, vous pourrez utiliser un maximum de 94 canaux d'entrée (lorsque le VM-24E et le DIF-AT sont utilisés). Roland vous recommande d'installer un VM-24C.

- 1 Éteindre l'appareil et déconnecter tous les câbles du VM-7000.
- 2 N'enlever que les vis spécifiées sur le schéma suivant et détacher la plaque du dessus du VM-7000.



- 3 Insérer simultanément le connecteur du VM-24C dans le connecteur interne et les broches en plastique dans les trous du VM-24C pour le fixer fermement.



- 4 Utiliser les vis enlevées à l'étape 2 pour fixer à nouveau la plaque du dessus.
- 5 Ceci complète l'installation du VM-24C.

**NOTE**

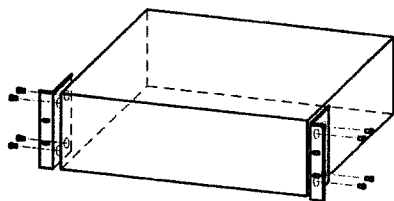
Il est impossible d'utiliser le connecteur CASCADE si le VM-24C n'est pas installé. (p. 32)

## Installation de dispositifs optionnels

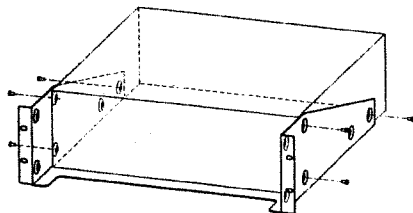
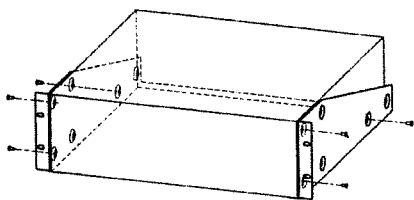
### Changement du matériel de montage en rack (RO-7000)

La série VM-7000 est fournie avec des supports pré-installés en rack qui permettent à l'appareil d'être monté dans un rack. Un différent ensemble de supports (RO-7000) est vendu en option. Quand le RO-7000 est installé, le VM-7000 sera positionné légèrement vers l'arrière (éloigné de vous) dans le rack. Ainsi, les connecteurs de câbles qui sont branchés dans les fiches de la plaque avant ne gêneront pas.

- 1 Éteindre l'appareil et déconnecter tous les câbles du VM-7000.
- 2 N'enlever que les vis spécifiées sur le schéma suivant et détacher les supports de rack fournis avec votre VM-7000.



- 3 Utiliser les vis enlevées à l'étape 2 et fixer le RO-7000.



- 4 Ceci complète l'installation du RO-7000.

**MEMO**

Il y a deux façons de fixer le RO-7000. Utiliser la méthode qui vous convient le mieux.

# Basic Connections

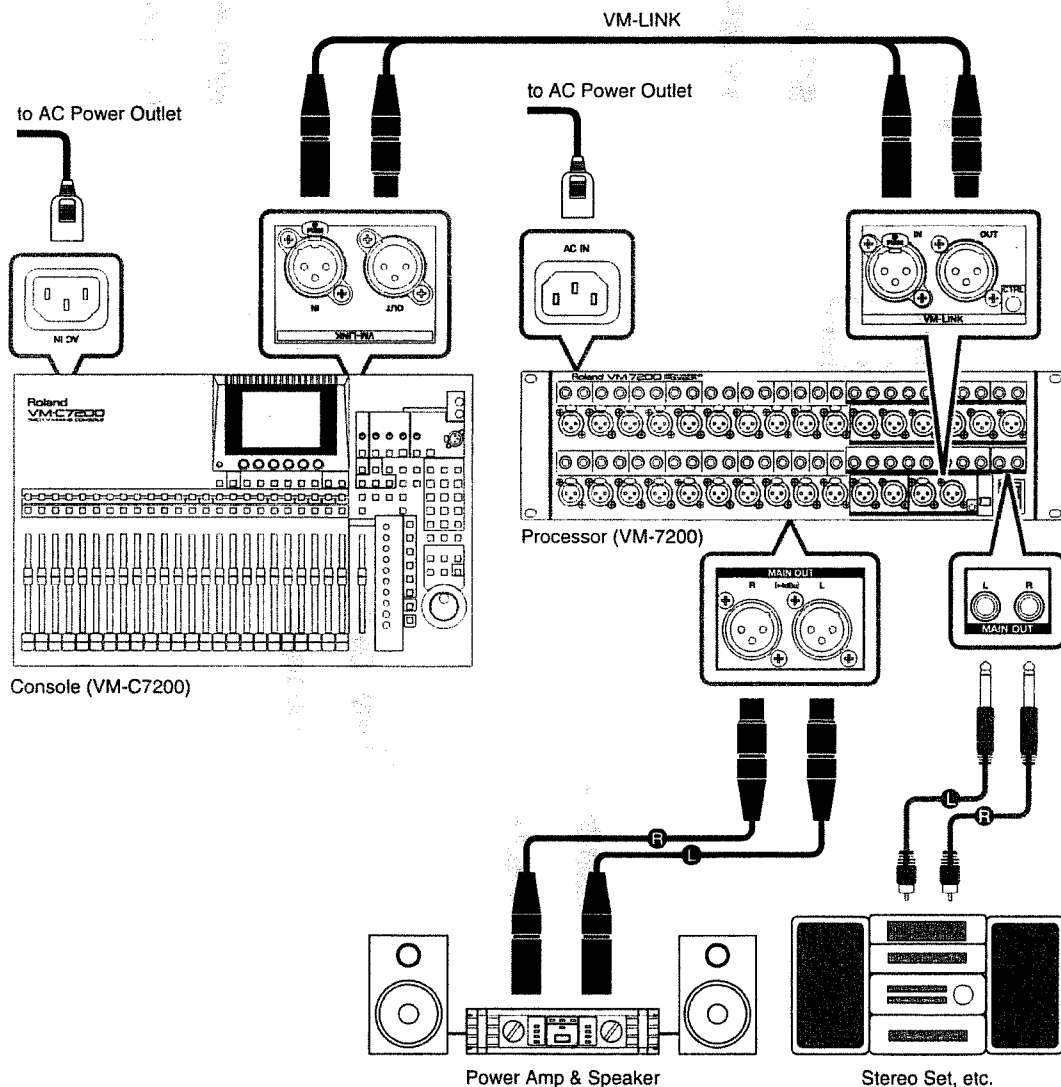
## Connecting to the Console (VM-LINK)

The VM-7200 (VM-7100) connects to Roland mixing consoles (VM-C7200, VM-C7100). Use the VM-LINK cable (AES/EBU digital audio cable) included with the unit.

### ■ Connecting to the VM-C7200



To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.



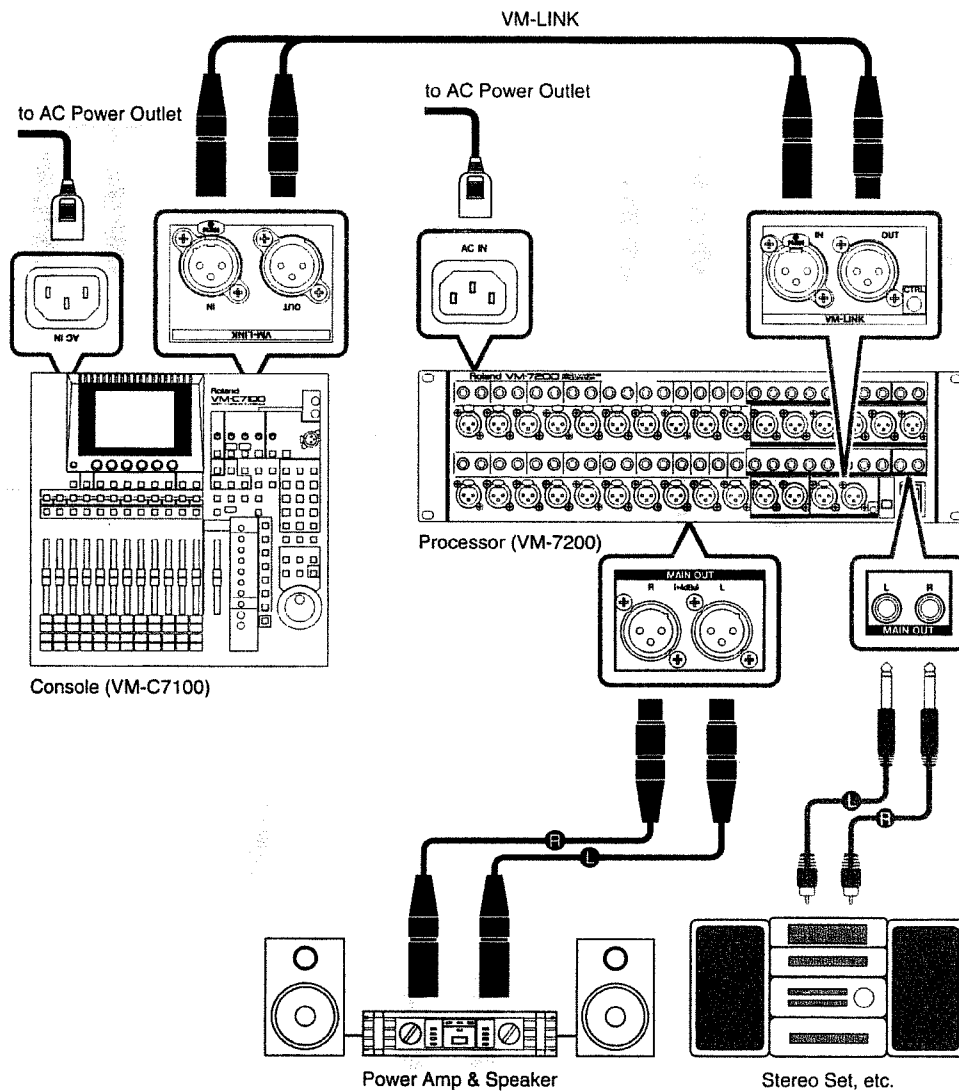
If using headphones, connect the headphones to the VM-C7200's PHONES jack.

## Basic Connections

### ■ Connecting to the VM-C7100



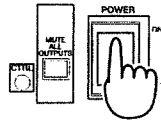
To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.



If using headphones, connect the headphones to the VM-C7100's PHONES jack.

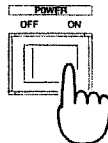
## Turning On the Power

- 1 Switch on the **POWER switch** on the mixing processor (VM-7200, VM-7100), and confirm that the **CTRL indicator** is lit.



Press "ON" (upper) side of the POWER switch.

- 2 Switch on the **POWER switch** on the mixing console (VM-C7200, VM-C7100).



Press "ON" (right) side of the POWER switch.

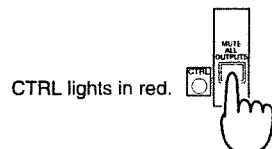
- 3 Turn on the power to the audio devices (power amps, monitor speakers, and other devices) connected to the mixing processor.
- 4 Raise the volume on the audio equipment to a suitable level.

## Muting

Ordinarily, to prevent noise when turning the power on and off, or when plugging in or unplugging microphones and instruments from the processor, the volume levels on all devices are lowered.

However, when working in situations where it is difficult to lower the volume, such as when the processor and console are separated, you can instead temporarily mute the sound coming from the processor.

- 1 Press **[MUTE ALL OUTPUTS]** on the processor's front panel. No sound is output from the processor while the button is held down (the sound is muted). At this time, **CTRL lights in red**.



While the button is held down, the sound is muted.

- 2 When you have finished connecting the microphone (or whatever it was you needed to do), release **[MUTE ALL OUTPUTS]**.

### NOTE

Once the connections have been completed (p. 23), turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing malfunction and/or damage to speakers and other devices.

Always make sure to have the volume level turned down before switching on power. Even with the volume all the way down, you may still hear some sound when the power is switched on, but this is normal, and does not indicate a malfunction.

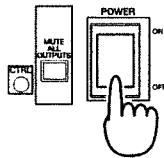
### MEMO

During start-up, the processor's **CTRL** indicator lights in orange. **CTRL** changes to green when the processor has completed start-up properly.

Begin the system configuration check only after you've confirmed that the processor has started up properly (**CTRL** is lit in green). Refer to the console Owner's Manual.

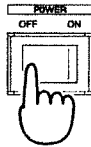
### Turning Off the Power

- 1 Lower the volume on all devices.
- 2 Turn off the power to the audio devices.
- 3 If needed, record the current operating settings internally to the console or to a memory card.
- 4 Press the mixing console (VM-C7200, VM-C7100) **POWER switch** to turn the power off.



Press "OFF" (lower) side of the POWER switch.

- 5 Press the mixing processor (VM-7200, VM-7100) **POWER switch** to turn the power off.



Press "OFF" (left) side of the POWER switch.



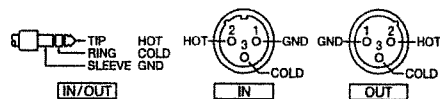
# Various Connection Setups

## Connecting Microphones and Instruments (Analog Connection)

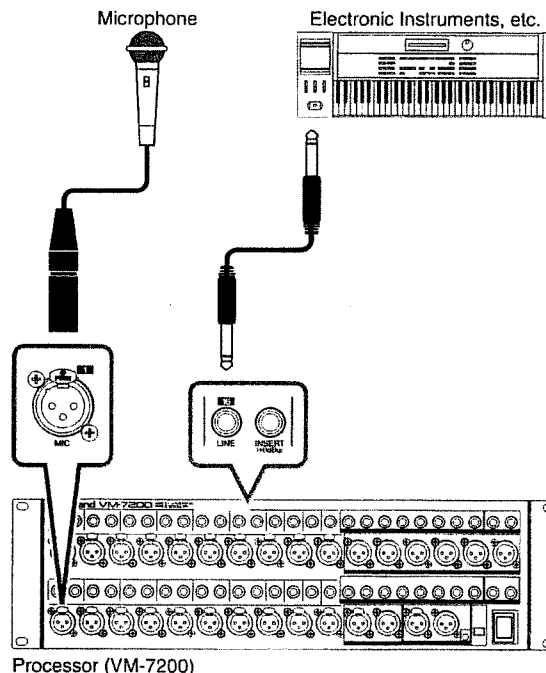
This section describes examples of connecting microphones and instruments to the processor.

### Precautions When Connecting Microphones

- The pin assignment for the each connectors is as shown below. Before making any connections, make sure that this pin assignment is compatible with that of all your other devices.



- Howling could be produced depending on the location of microphones relative to speakers. This can be remedied by:
  - 1 Changing the orientation of the microphone(s).
  - 2 Relocating microphone(s) at a greater distance from speakers.
  - 3 Lowering volume levels.
- Carefully read the owner's manual for the microphone you are using, and unless you are connecting a condenser mic requiring phantom power, be sure turn phantom power off (refer to the console Owner's Manual). Supplying phantom power to dynamic microphones or keyboards may result in damage to the equipment.
- Turn the phantom power on or off only after muting the channels to which condenser microphones are connected. A loud noise or pop is produced when the phantom power is turned on or off without muting first, and this noise can severely damage amps, speakers, or other equipment.
  - 1 Completely lower the console's MASTER fader.
  - 2 Select the channel to which you want to input the sound, and connect the microphone or instrument to the corresponding INPUT jack.



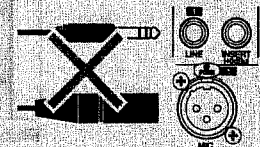
### MEMO

When the console and processor are separated, hold down **[MUTE ALL OUTPUTS]** on the processor.



### NOTE

Do not have plugs connected to both the MIC connector and LINE jack inputs for the same channel simultaneously. Select one or the other for use.



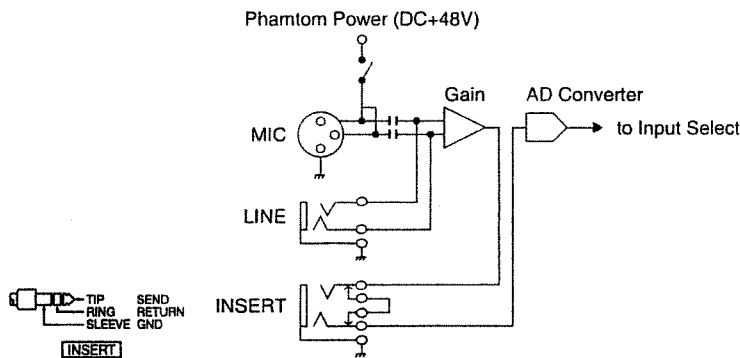
## Various Connection Setups

- 3 Raise the MASTER fader and the applicable channel fader.

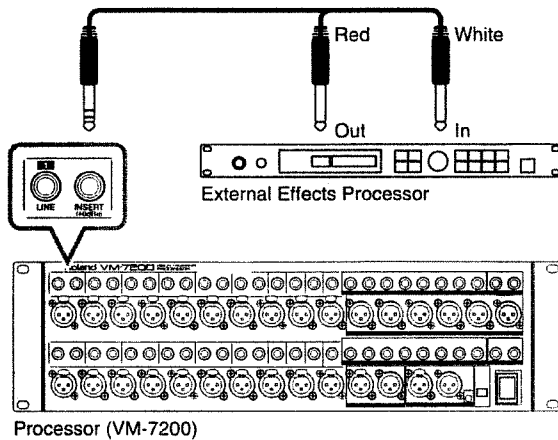
### ■ Using External Effects (Insert)

Use the **INSERT jacks** when you want use an external effects device (Insert) to process the sounds from microphones or instruments that are input to the channels. A branch cable must be obtained for this.

INSERT Jack Block Diagram is as shown below.



- 1 Mute the channel that you want to process with effects (refer to the console Owner's Manual).
- 2 Connect the external effects device to the INSERT jack for the channel selected in Step 1.



- 3 Release the mute on the channel to be processed with effects, then raise the MASTER fader and the applicable channel fader.

### MEMO

INSERT jacks are used for Channels 1-6 (Channels 11-16). In addition, the MIC jacks and LINE jacks can also be used for connecting.



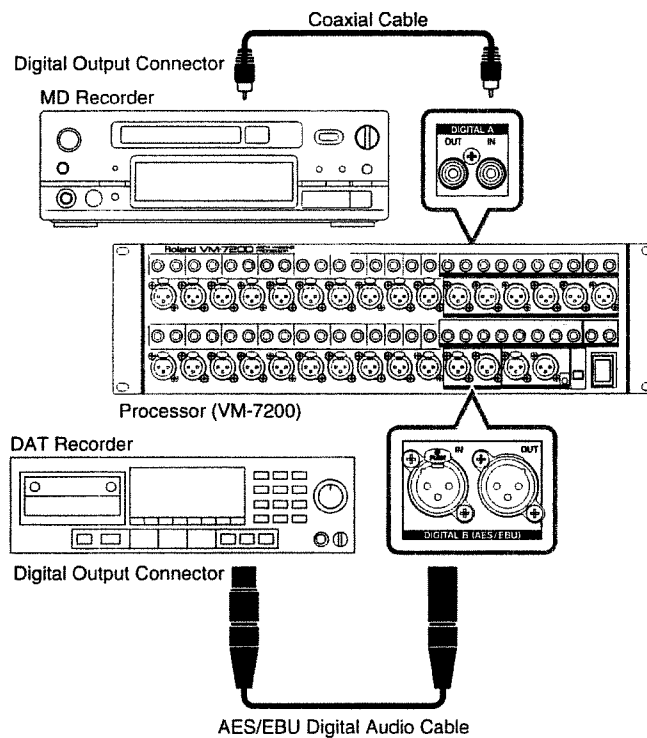
## Connecting MD Recorders, CD Players, and Other Digital Devices (Digital Connection)

When you want to connect the processor to a professional DAT recorder, a consumer MD or CD player, or other such digital device, use the **DIGITAL connectors**. First obtain a connector cable compatible with the digital device you are using. Digital audio signals input through the DIGITAL connectors are assigned to Channels 21/22.

- 1 Mute Channels 21/22 (refer to the console Owner's Manual).
- 2 Connect to the output connector of the external digital device you are using. When connecting to digital devices for professional use (with XLR connectors), connect to **DIGITAL B IN**. When connecting to MD or CD player, or other such digital device for consumer use (with coaxial connectors), connect to **DIGITAL A IN**. However, **DIGITAL A IN** and **DIGITAL B IN** cannot be used simultaneously.

### MEMO

When connecting digital devices featuring optical type connectors, it will be necessary to obtain a commercially available optical/coaxial converter.



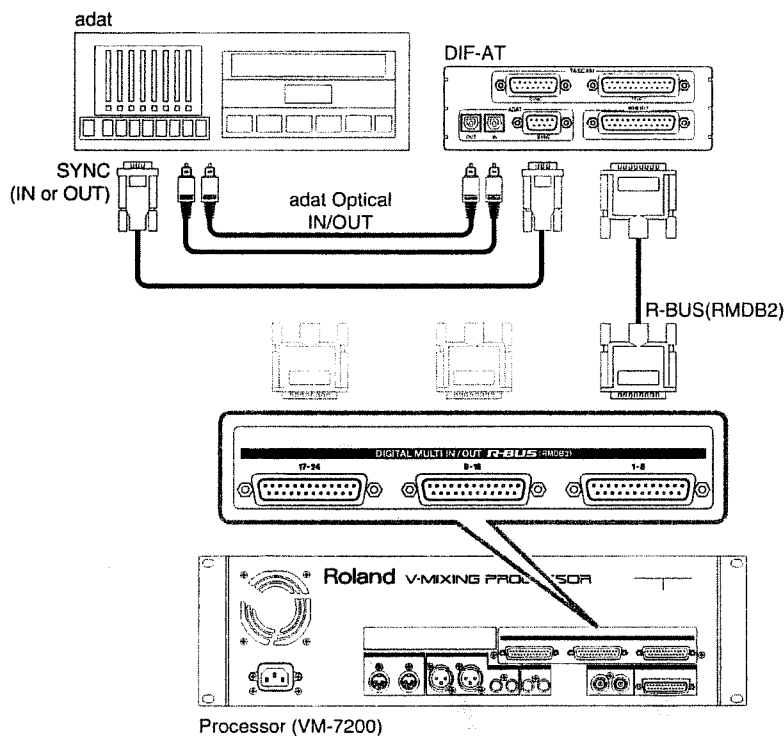
- 3 Release the mute on Channels 21/22, then raise the MASTER fader and the Channel 21/22 faders.

## Various Connection Setups

### Connecting the Roland DIF-AT (R-BUS (RMDB2) Connection)

Roland also makes available the **VM-24E** I/O Expansion Board, which can be purchased separately. When the VM-24E is installed, you can add three R-BUS (RMDB2) connectors (p. 14, 19). By connecting a Roland DIF-AT, you can exchange 8-in/8-out 24-bit digital audio signals with a digital multitrack recorder, such as the ALESIS adat or the TASCAM DA-88 (maximum of three recorders).

### ■ Connecting the ALESIS adat



- 1 Use the R-BUS cable included with the DIF-AT to connect the DIF-AT and the processor.
- 2 Use an optical cable (sold separately) for use with adat to connect the adat and the DIF-AT. Make the settings for the console (master or slave) according to the connections used. Refer to the console Owner's Manual and DIF-AT Owner's Manual.
- 3 Press the Mixing Processor (VM-7200, VM-7100) **POWER switch** to turn on the power. Confirm that the DIF-AT's POWER indicator is lit.



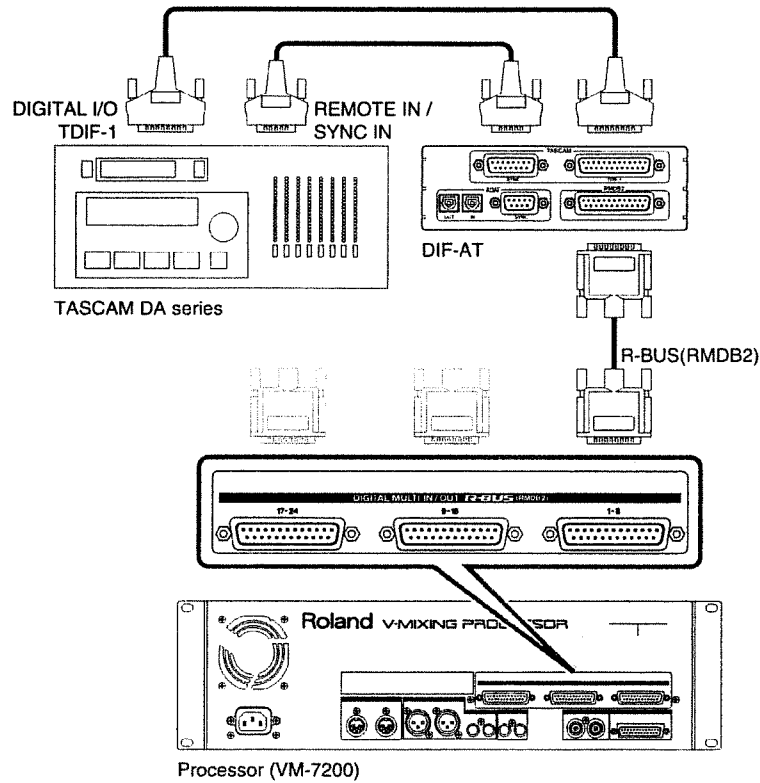
To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.



Connecting to the adat's SYNC IN connector the adat in Sync Slave mode. This setup enables the transport controls to be operated from the console.

Connecting to the adat's SYNC OUT connector the adat in Sync Master mode. In this setup, the transport controls cannot be operated from the console.

## ■ Connecting the TASCAM DA Series



- 1 Use the R-BUS cable included with the DIF-AT to connect the DIF-AT and the processor.
- 2 Use a cable for use with TASCAM devices (sold separately) to connect the TASCAM DA Series and the DIF-AT.
- 3 Press the Mixing Processor (VM-7200, VM-7100) **POWER switch** to turn on the power. Confirm that the DIF-AT's POWER indicator is lit.

## Various Connection Setups

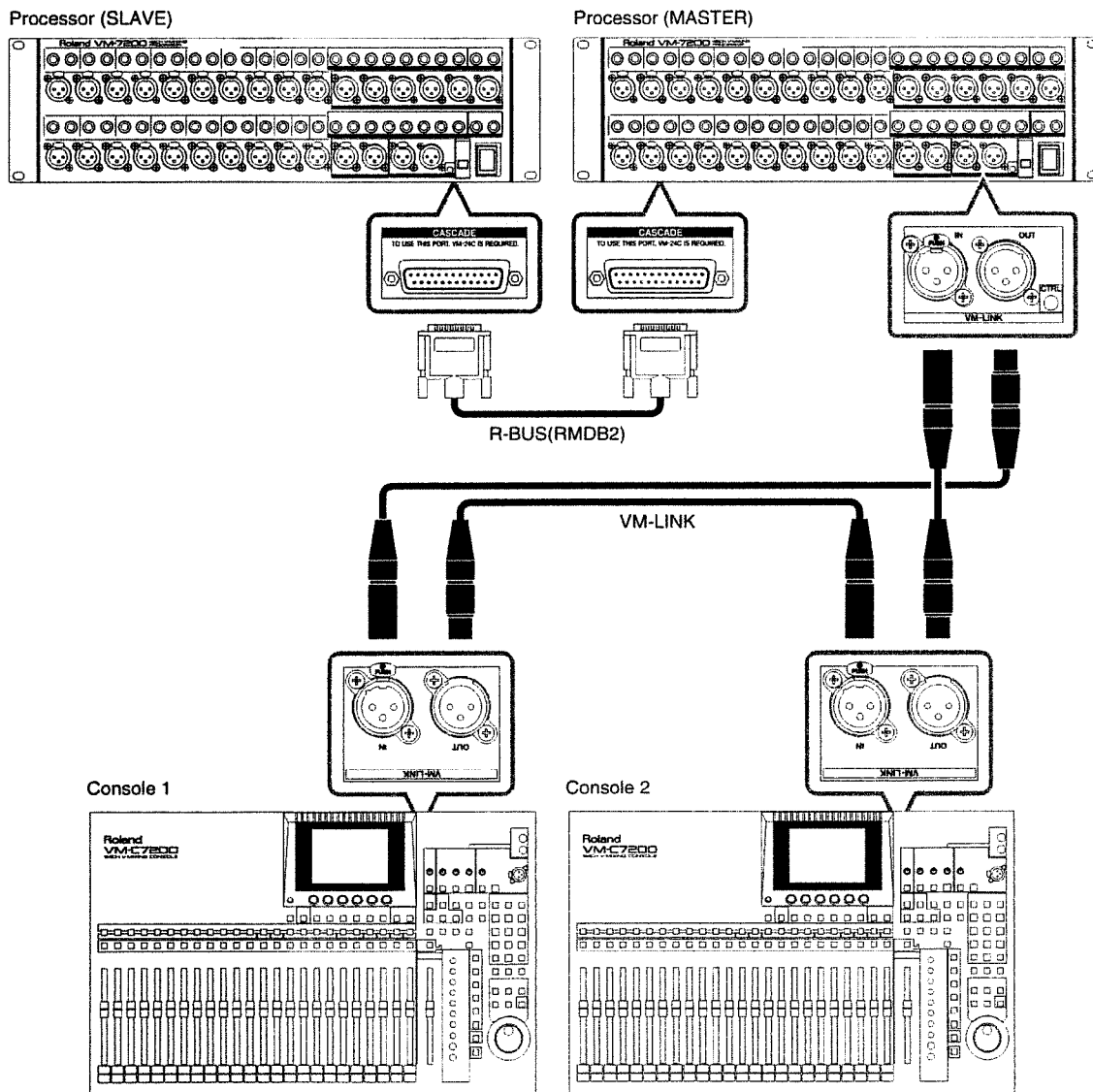
### Connecting Two Processors (Cascade Connection)

Roland also offers the **VM-24C** Cascade Kit, available for separate purchase. Once the VM-24C is installed, you will be able to use the **CASCADE** connector (p. 16, 21). By cascading two VM-7000 series units, a maximum of 94 input channels can be supported (when the VM-24E and DIF-AT are used). Roland recommends that you install a VM-24C.

The VM-24C includes two boards, a **MASTER** and a **SLAVE**. Install the **MASTER** board in one of the processors and the **SLAVE** board in the other processor (p. 16, 21). The **CASCADE** connectors cannot be used unless both boards are installed.



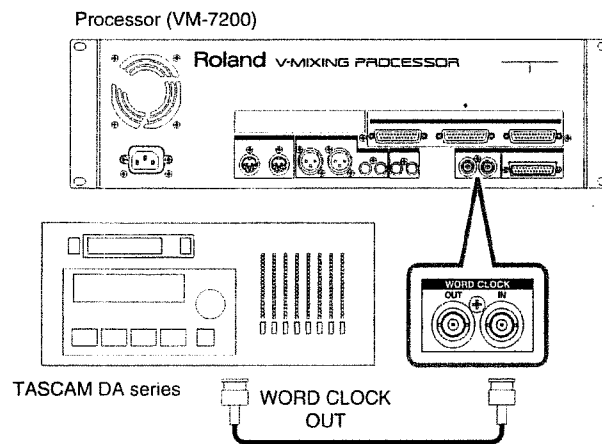
To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.



- 1 Use the R-BUS cable included with the VM-24C to connect the two processors.
- 2 Use the VM-LINK cable included with the console to connect the master processor and the consoles. **Be careful not to connect VM-LINK cable to the slave processor.**
- \* *In console Owner's Manual, the master processor is called the **1st UNIT** and the slave processor is called the **2nd UNIT**.*
- 3 Turn the **POWER switch** on each processor to ON.
- 4 Turn the **POWER switch** on each console to ON.
- 5 The processor with the **MASTER** board installed becomes the Cascade connection master.

### Connecting Word Clock

In cases such as when connecting multiple devices in a studio using digital connections, a standardized signal for synchronization is needed so that the digital audio for each device can be exchanged correctly. This synchronizing signal is known as **word clock**. In general, a digital multitrack recorder or word clock generator is used as the master, and a mixing processor (VM-7200, VM-7100) or other digital device operates as the slave.



- 1 Use a word clock cable to connect the word clock master (in this example, a digital multitrack recorder) and the processor.
- 2 Turn the **POWER switch** on the processor to ON.
- 3 Turn the **POWER switch** on the console to ON.
- 4 Set the processor to function as the word clock slave (refer to the console Owner's Manual for instructions).

#### MEMO

The processor which includes the SLAVE board of the VM-24C cascade kit does not work as a master unit in the single processor configuration.

If you wish, please take the SLAVE board off the processor. (p. 16, 21)

#### NOTE

To prevent malfunction and/or damage to speakers and/or other devices, always turn down the volume, and turn off the power on all devices before making any connections.

#### MEMO

The processors can function as both word clock master and slave (refer to the console Owner's Manual).

Connection of the word clock is not required when using the Roland DIF-AT to ALESIS adat or TASCAM DA Series recorders (p. 30, 31).

# Troubleshooting

If it appears that the VM-7200 or VM-7100 is not operating properly, check over the suggested remedies below before assuming that the unit is experiencing a malfunction. If after checking the following you find that the problem persists, call Roland Information or consult your nearby Roland Service Center or Roland dealer.

## **No Sound**

- Power to the processor, console, or other connected device has not been turned on.
- The VM-LINK cable is not properly connected (p. 23).
- An audio cable is not properly connected (p. 23).
- The volume level of a connected amp or speakers is turned down.
- Channel faders or Master faders are lowered.
- Channels are muted (p. 25).
- You are using a power cord other than the original cord provided with the equipment.
  - Some third-party power cords, while resembling the original, may not make secure electrical contact, resulting in poor operation. Be sure to use only the power cord included with each device.
- The volume level of the instrument connected to Processor is too low.
  - Could you be using a connection cable that contains a resistor? Use a connection cable that does not contain a resistor.
- A device that consumes large amounts of power is being used at the same time.
  - Other devices can cause a severe reduction in voltage. Use a separate electrical outlet for any piece of equipment that consumes large amounts of electricity.

## **No Sound From Specific Channel**

- The input sensitivity (pre amp gain) is too low.
- There is a discrepancy between the channel assigned to the channel fader and the channel used for that sound.
- The Solo or Mute function is being used.

## **Sound is Noisy or Distorted**

- The input sensitivity (pre amp gain) is not set properly.
  - Setting the input sensitivity too high distorts the sound; conversely, when the input sensitivity is set too low, the sound becomes very noisy. Set the input sensitivity so that the level meter fluctuates at as high a level as possible within the range of -12 to 0 dB (refer to the console Owner's Manual).
- A device producing noise (such as a computer or monitor) is set up near a connected microphone.
- The equalizer is being used.
  - Some equalizer settings may cause the sound to become distorted. In such cases, readjust the equalizer.
- The recording or playback pitch of a connected digital multitrack recorder (such as an ALESIS adat or TASCAM DA) has been changed (the Vari-Pitch function has been used).
  - The maximum sampling rate for the VM-7000 Series is 48 kHz. Thus, raising the pitch with the Vari-Pitch function when the digital MTR's Master Clock is already running at 48 kHz can cause noise to be produced. In such cases, use an analog connection for the audio signals.



## **Effect Not Applied**

- The VS8F-2 has not been installed in the processor (p. 13, 18).
- Channel effect send levels are lowered (refer to the console Owner's Manual).
- The effect is already being inserted into another channel.
- You are trying to select an algorithm that cannot be used in the master effects.
- External effects are being used.
  - Check the INSERT jack block diagram, and reconnect the Send and Return properly (p. 28).

## **Cannot Make Cascade Connection**

- The VM-24C has not been installed on both processors that are being connected (p. 16, 21).
- The R-BUS (RMDB2) cable included with the VM-24C is not being used (p. 32).
  - Although they look similar, SCSI cables and cables for TASCAM devices are not compatible and cannot be used. Using other cables may result in damage to the equipment; be sure to use the R-BUS (RMDB2) cable.
- The master and slave are not connected correctly (p. 32).
  - Sounds from the master processor cannot be output from the slave processor. Use the processor with the VM24-C MASTER board installed as the master.

## **Cannot Connect Digital MTR (ALESIS adat, TASCAM DA, or Other)**

- VM-24E has not been installed in the processor (p. 14, 19).
- The R-BUS (RMDB2) cable included with the DIF-AT is not being used (p. 30).
  - Although they look similar, SCSI cables and cables for TASCAM devices are not compatible and cannot be used. Using other cables may result in damage to the equipment; be sure to use the R-BUS (RMDB2) cable.

# MIDI Implementation

Model: VM-7100/VM-7200, Version 1.00, Jun. 25 1999

## 1. Transmitted Data and Recognized Receive Data

### ■Channel Voice Message

#### ●Polyphonic Key Pressure

Transmits the level meter value according to the value of "Level Meter Tx. via MIDI."  
When the spectrum analyzer was selected as the effect type, sends the level value at each frequency band area.  
Ignored when received.

Status                    Second                    Third  
AnH                    mmH                    IH

n = MIDI Channel No.:    0H - FH (ch.1 - ch.16)  
mm = Note No.:        00H - 27H (D - 39) (\*1)  
ll = Level Meter Value: 00H - 36H (0 - 54) (\*2)

#### Level Meter and Note No.

Level Meter	Input	MultiIn	FlexBus	MultiOut	Spectrum	Effects
Target	Level Meter	Level Meter	Level Meter	Level Meter	Level Meter	Level Meter
Note	Channel	Channel	Channel	Channel	Channel	Channel
0	Input 1	MultiIn 1	BUS 1	Assign Out 1	Analyzer 20 Hz	FX1 Input Lch
1	Input 2	MultiIn 2	BUS 2	Assign Out 2	Analyzer 25 Hz	FX1 Input Rch
2	Input 3	MultiIn 3	BUS 3	Assign Out 3	Analyzer 31.5Hz	FX1 Output Lch
3	Input 4	MultiIn 4	BUS 4	Assign Out 4	Analyzer 40 Hz	FX1 Output Rch
4	Input 5	MultiIn 5	BUS 5	Assign Out 5	Analyzer 50 Hz	FX2 Input Lch
5	Input 6	MultiIn 6	BUS 6	Assign Out 6	Analyzer 63 Hz	FX2 Input Rch
6	Input 7	MultiIn 7	BUS 7	Assign Out 7	Analyzer 80 Hz	FX2 Output Lch
7	Input 8	MultiIn 8	BUS 8	Assign Out 8	Analyzer 100 Hz	FX2 Output Rch
8	Input 9	MultiIn 9	BUS 9	Assign Out 9	Analyzer 125 Hz	FX2 Input Lch
9	Input 10	MultiIn 10	BUS 10	Assign Out 10	Analyzer 160 Hz	FX3 Input Rch
10	Input 11	MultiIn 11	BUS 11	Assign Out 11	Analyzer 200 Hz	FX3 Input Lch
11	Input 12	MultiIn 12	BUS 12	Assign Out 12	Analyzer 250 Hz	FX3 Output Rch
12	Input 13	MultiIn 13	-	Assign Out 13	Analyzer 315 Hz	FX4 Input Lch
13	Input 14	MultiIn 14	-	Assign Out 14	Analyzer 400 Hz	FX4 Input Rch
14	Input 15	MultiIn 15	-	Assign Out 15	Analyzer 500 Hz	FX4 Output Lch
15	Input 16	MultiIn 16	-	Assign Out 16	Analyzer 630 Hz	FX4 Output Rch
16	Input 17	MultiIn 17	-	Assign Out 17	Analyzer 800 Hz	FX5 Input Lch
17	Input 18	MultiIn 18	-	Assign Out 18	Analyzer 1.0kHz	FX5 Input Rch
18	Input 19	MultiIn 19	-	Assign Out 19	Analyzer 1.2kHz	FX5 Output Lch
19	Input 20	MultiIn 20	-	Assign Out 20	Analyzer 1.6kHz	FX5 Output Rch
20	Input 21	MultiIn 21	-	Assign Out 21	Analyzer 2.0kHz	FX6 Input Lch
21	Input 22	MultiIn 22	-	Assign Out 22	Analyzer 2.5kHz	FX6 Input Rch
22	Input 23	MultiIn 23	-	Assign Out 23	Analyzer 3.2kHz	FX6 Output Lch
23	Input 24	MultiIn 24	-	Assign Out 24	Analyzer 4.0kHz	FX6 Output Rch
24	-	-	-	-	Analyzer 5.0kHz	FX7 Input Lch
25	-	-	-	-	Analyzer 6.3kHz	FX7 Input Rch
26	-	-	-	-	Analyzer 8.0kHz	FX7 Output Lch
27	-	-	-	-	Analyzer 10 kHz	FX7 Output Rch
28	-	-	-	-	Analyzer 12 kHz	FX8 Input Lch
29	-	-	-	-	Analyzer 16 kHz	FX8 Input Rch
30	-	-	-	-	Analyzer 20 kHz	FX8 Output Lch
31	-	-	-	-	Analyzer Input	FX8 Output Rch
32	MONITOR Lch	MONITOR Lch	MONITOR Lch	MONITOR Lch	MONITOR Lch	MONITOR Lch
33	MONITOR Rch	MONITOR Rch	MONITOR Rch	MONITOR Rch	MONITOR Rch	MONITOR Rch
34	MASTER Lch	MASTER Lch	MASTER Lch	MASTER Lch	MASTER Lch	MASTER Lch
35	MASTER Rch	MASTER Rch	MASTER Rch	MASTER Rch	MASTER Rch	MASTER Rch
36	-	-	-	-	-	MST FX Input Lch
37	-	-	-	-	-	MST FX Input Rch
38	-	-	-	-	-	MST FX Output Lch
39	-	-	-	-	-	MST FX Output Rch
40	-	-	-	-	-	-
41	-	-	-	-	-	-
42	-	-	-	-	-	-
43	-	-	-	-	-	-
44	-	-	-	-	-	-
45	-	-	-	-	-	-
46	-	-	-	-	-	-
47	-	-	-	-	-	-
48	-	-	-	-	-	-
49	-	-	-	-	-	-
50	-	-	-	-	-	-
51	-	-	-	-	-	-
52	-	-	-	-	-	-
53	-	-	-	-	-	-
54	-	-	-	-	-	-
55	-	-	-	-	-	-
56	-	-	-	-	-	-
57	-	-	-	-	-	-
58	-	-	-	-	-	-
59	-	-	-	-	-	-
60	-	-	-	-	-	-
61	-	-	-	-	-	-
62	-	-	-	-	-	-
63	-	-	-	-	-	-

#### Level Meter Value and Level

Level Meter / Spectrum Analyzer

Value	Level
0	0 dB
1	-1 dB
2	-2 dB
:	
127	-∞ dB

#### ●Control Change

Parameters on the Mixer section can be received and transmitted by the control change messages when the VM-Link is connected and moreover "MIDI Control Type (\*1)" in the SYSTEM parameter is set to "C.C."

When the VM-Link is not connected and moreover the "MIDI Control Type (\*1)" is set to "C.C." or "NRPN," the message can be received.

Status                    Second                    Third  
BnH                    mmH                    IH

n = MIDI Channel No.:    0H - FH (ch.1 - ch.16; see below)  
mm = Mixer Parameter No.: (see below)  
ll = Mixer Parameter Value: 00H - 7FH (0 - 127) (\*1)

#### When "MIDI C.C. Type (\*1)" in the SYSTEM parameter is set to "Mono"

When "MIDI Control Type (\*1)" in the SYSTEM parameter is set to "C.C.," Level parameter/Switch parameter/Pan parameter of the MIXER parameter were transmitted and received according to the "MIDI Control Change Type Assign" and "MIDI Control Change Channel Assign" setting in the SYSTEM parameter.

The transmitted MIDI channel is set by the "MIDI Control Channel (\*1)" in the VM-7200/7100.

#### Mixer Parameter and MIDI Channel/Control Change No. default value

<Channel Strip>

C.C.#	Control Parameter	C.C.#	Control Parameter
0	-----	64	Input 6 Main Sw
1	Input 1 Main Level	65	Input 7 Main Sw
2	Input 2 Main Level	66	Input 8 Main Sw
3	Input 3 Main Level	67	Input 9 Main Sw
4	Input 4 Main Level	68	Input 10 Main Sw
5	Input 5 Main Level	69	Input 11 Main Sw
6	Input 6 Main Level	70	Input 12 Main Sw
7	Input 7 Main Level	71	Input 13 Main Sw
8	Input 8 Main Level	72	Input 14 Main Sw
9	Input 9 Main Level	73	Input 15 Main Sw
10	Input 10 Main Level	74	Input 16 Main Sw
11	Input 11 Main Level	75	Input 17 Main Sw
12	Input 12 Main Level	76	Input 18 Main Sw
13	Input 13 Main Level	77	Input 19 Main Sw
14	Input 14 Main Level	78	Input 20 Main Sw
15	Input 15 Main Level	79	Input 21 Main Sw
16	Input 16 Main Level	80	Input 22 Main Sw
17	Input 17 Main Level	81	Input 23 Main Sw
18	Input 18 Main Level	82	Input 24 Main Sw
19	Input 19 Main Level	83	MultiIn 1 Main Sw
20	Input 20 Main Level	84	MultiIn 2 Main Sw
21	Input 21 Main Level	85	MultiIn 3 Main Sw
22	Input 22 Main Level	86	MultiIn 4 Main Sw
23	Input 23 Main Level	87	MultiIn 5 Main Sw
24	Input 24 Main Level	88	MultiIn 6 Main Sw
25	MultiIn 1 Main Level	89	MultiIn 7 Main Sw
26	MultiIn 2 Main Level	90	MultiIn 8 Main Sw
27	MultiIn 3 Main Level	91	MultiIn 9 Main Sw
28	MultiIn 4 Main Level	92	MultiIn 10 Main Sw
29	MultiIn 5 Main Level	93	MultiIn 11 Main Sw
30	MultiIn 6 Main Level	94	MultiIn 12 Main Sw
31	MultiIn 7 Main Level	95	MultiIn 13 Main Sw
32	-----	96	-----
33	MultiIn 8 Main Level	97	-----
34	MultiIn 9 Main Level	98	-----
35	MultiIn 10 Main Level	99	-----
36	MultiIn 11 Main Level	100	-----
37	MultiIn 12 Main Level	101	-----
38	MultiIn 13 Main Level	102	MultiIn 14 Main Sw
39	MultiIn 14 Main Level	103	MultiIn 15 Main Sw
40	MultiIn 15 Main Level	104	MultiIn 16 Main Sw
41	MultiIn 16 Main Level	105	MultiIn 17 Main Sw
42	MultiIn 17 Main Level	106	MultiIn 18 Main Sw
43	MultiIn 18 Main Level	107	MultiIn 19 Main Sw
44	MultiIn 19 Main Level	108	MultiIn 20 Main Sw
45	MultiIn 20 Main Level	109	MultiIn 21 Main Sw
46	MultiIn 21 Main Level	110	MultiIn 22 Main Sw
47	MultiIn 22 Main Level	111	MultiIn 23 Main Sw
48	MultiIn 23 Main Level	112	MultiIn 24 Main Sw
49	MultiIn 24 Main Level	113	-----
50	Bus 1 Master Level	114	-----
51	Bus 2 Master Level	115	-----
52	Bus 3 Master Level	116	-----
53	Bus 4 Master Level	117	-----
54	Bus 5 Master Level	118	-----
55	Bus 6 Master Level	119	-----
56	Bus 7 Master Level	120	-----
57	Bus 8 Master Level	121	-----
58	Main Master Level	122	-----
59	Input 1 Main Sw	123	-----
60	Input 2 Main Sw	124	-----
61	Input 3 Main Sw	125	-----
62	Input 4 Main Sw	126	-----
63	Input 5 Main Sw	127	-----



○ When the "MIDI C.C. Type (\*1)" in the SYSTEM parameter is set to "Multi"

When the "MIDI C.C. Type (\*1)" is set to "Multi," the MIXER parameters in the VM-7200/7100 is transmitted and received through the multiple MIDI channels. This function is used for controlling the Mixer section of the VM-7200/7100 or the GM sound module.

Mixer Parameter and MIDI Channel/Control Change No.

<Channel Strip>

Input	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIDI channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Master Fader Level	7	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Main Send Pan	10	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Freq.	12	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Gain	13	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Freq.	14	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Gain	15	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Q	16	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Freq.	17	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Gain	18	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus1 Send Level	19	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus2 Send Level	20	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus3 Send Level	21	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus4 Send Level	22	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus5 Send Level	23	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus6 Send Level	24	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus7 Send Level	25	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus8 Send Level	26	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Input Mute Sw	27	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->

Input	17	18	19	20	21	22	23	24
MIDI channel	1	2	3	4	5	6	7	8
MIX Send Level	68	->	->	->	->	->	->	->
MIX Send Pan/Bal	70	->	->	->	->	->	->	->
EQ L Freq.	71	->	->	->	->	->	->	->
EQ L Gain	72	->	->	->	->	->	->	->
EQ HM Freq.	73	->	->	->	->	->	->	->
EQ HM Gain	74	->	->	->	->	->	->	->
EQ HM Q	75	->	->	->	->	->	->	->
EQ H Freq.	76	->	->	->	->	->	->	->
EQ H Gain	77	->	->	->	->	->	->	->
Bus1 Send Level	78	->	->	->	->	->	->	->
Bus2 Send Level	79	->	->	->	->	->	->	->
Bus3 Send Level	80	->	->	->	->	->	->	->
Bus4 Send Level	81	->	->	->	->	->	->	->
Bus5 Send Level	82	->	->	->	->	->	->	->
Bus6 Send Level	83	->	->	->	->	->	->	->
Bus7 Send Level	84	->	->	->	->	->	->	->
Bus8 Send Level	85	->	->	->	->	->	->	->
Input Mute Sw	86	->	->	->	->	->	->	->

Multilin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIDI channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Main Send Level	39	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Main Send Pan	42	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Freq.	44	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Gain	45	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Freq.	46	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Gain	47	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ HM Q	48	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Freq.	49	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Gain	50	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus1 Send Level	51	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus2 Send Level	52	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus3 Send Level	53	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus4 Send Level	54	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus5 Send Level	55	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus6 Send Level	56	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus7 Send Level	57	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus8 Send Level	58	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
MultiIn Mute Sw	59	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->

Multilin	17	18	19	20	21	22	23	24
MIDI channel	1	2	3	4	5	6	7	8
MIX Send Level	102	->	->	->	->	->	->	->
MIX Send Pan/Bal	103	->	->	->	->	->	->	->

EQ L Freq.	104	->	->	->	->	->	->	->
EQ L Gain	105	->	->	->	->	->	->	->
EQ HM Freq.	106	->	->	->	->	->	->	->
EQ HM Gain	107	->	->	->	->	->	->	->
EQ HM Q	108	->	->	->	->	->	->	->
EQ H Freq.	109	->	->	->	->	->	->	->
EQ H Gain	110	->	->	->	->	->	->	->
Bus1 Send Level	111	->	->	->	->	->	->	->
Bus2 Send Level	112	->	->	->	->	->	->	->
Bus3 Send Level	113	->	->	->	->	->	->	->
Bus4 Send Level	114	->	->	->	->	->	->	->
Bus5 Send Level	115	->	->	->	->	->	->	->
Bus6 Send Level	116	->	->	->	->	->	->	->
Bus7 Send Level	117	->	->	->	->	->	->	->
Bus8 Send Level	118	->	->	->	->	->	->	->
MultiIn Mute Sw	119	->	->	->	->	->	->	->

<Talk Back Section> MIDI channel + 9

Talk Back Level	68
Talk Back To Main	70
Talk Back To Bus1	78
Talk Back To Bus2	79
Talk Back To Bus3	80
Talk Back To Bus4	81
Talk Back To Bus5	82
Talk Back To Bus6	83
Talk Back To Bus7	84
Talk Back To Bus8	85
Talk Back Sw	86

<Slate Section> MIDI channel - 10

Slate Level	68
Slate To Main	70
Slate To Bus1	78
Slate To Bus2	79
Slate To Bus3	80
Slate To Bus4	81
Slate To Bus5	82
Slate To Bus6	83
Slate To Bus7	84
Slate To Bus8	85
Slate Sw	86

Bus Number	Bus1	Bus2	Bus3	Bus4	Bus5	Bus6	Bus7	Bus8
MIDI channel	12	13	14	15	12	13	14	15
Bus Master Level	68	->	->	->	102	->	->	->
Bus Return Pan	70	->	->	->	103	->	->	->

<Main Master Block> MIDI ch.=16

Main Master Level	68
Main Master Balance	70

**NRPN (MSB/LSB)**

Status	Second	Third
BnH	62H	63H
BnH	63H	mmH

n = MIDI Channel No.: 0H - FH (ch.1 - ch.16)  
 mm = upper byte of the parameter number to be assigned with NRPN: 00H - 7FH (0 - 127)  
 ll = lower byte of the parameter number to be assigned with NRPN: 00H - 7FH (0 - 127)

**This message is received at the following case.**

When the VM-Link is not connected and moreover the "MIDI Control Type (\*1)" is set to "NRPN" and moreover the MIDI channel of this message is same as the "MIDI Control Channel (\*1)."

After received this message, it is memorized as the "None Registered Parameter Number." "None Registered Parameter Number" value is equal to the "Start Address" referred in "2. Address Map for Data Transfer" section.

The address value range of "None Registered Parameter Number" is "00 00 00 - 00 7F 7F." See "2. Address Map for Data Transfer" section.

**This message is transmitted at the following case.**

When the VM-Link is connected and moreover the "MIDI Control Type (\*1)" is set to "NRPN" and moreover a parameter is modified.

# MIDI Implementation

This message is transmitted with the MIDI channel set at the "MIDI Control Channel (\*1)." "None Registered Parameter Number" value is equal to the "Start Address" referred in "2. Address Map for Data Transfer" section.  
The address value range of "None Registered Parameter Number" is "00 00 00 - 00 7F 7E."

(\*1) See "2. Address Map for Data Transfer" section.

## ○Data Entry (MSB/LSB)

Status	Second	Third
BnH	06H	mmH
BnH	26H	lH

n = MIDI Channel No.: 0H - FH (ch.1 - ch.16)

mm = upper byte corresponding to the parameter assigned with NRPN

l = lower byte corresponding to the parameter assigned with NRPN

<Ex> mmH 11H = 40H 00H = -8192  
= 7FH 7FH = -1  
= 60H 00H = 0  
= 3FH 7FH = +8191

### This message is received at the following case.

When the "MIDI Control Type (\*1)" parameter is set to "NRPN" and moreover the MIDI channel value with the message is same as the "MIDI Control Channel (\*1)."

After this message is received, the parameter is modified referring to the "None Registered Parameter Number."

When the "None Registered Parameter Number" is not set, this message was ineffective.

The setting value range of each parameter number is different.

See "2. Address Map for Data Transfer" section.

### This message is transmitted at the following case.

When the VM-Link is not connected and moreover "MIDI Control Type (\*1)" is set to "NRPN" and moreover the parameter is modified.

This message is transmitted with the MIDI channel set as "MIDI Control Channel (\*1)."

(\*1) See "2. Address Map for Data Transfer" section.

## ○Data Increment

When the VM-Link is not connected and moreover the "MIDI Control Type (\*1)" parameter is set to "NRPN" and moreover the MIDI channel value is same as the "MIDI Control Channel (\*1)" value.

After this message was received, the parameter is increased referring to the "None Registered Parameter Number."

The VM-7200/7100 doesn't transmit this message.

Status	Second	Third
BnH	60H	00H

n = MIDI Channel No.: 0H - FH (ch.1 - ch.16)

Increment the effect parameter selected with NRPN.

(\*1) See "2. Address Map for Data Transfer" section.

## ○Data Decrement

When the VM-Link is not connected and moreover the "MIDI Control Type (\*1)" parameter is set to "NRPN" and moreover the MIDI channel value is same as the "MIDI Control Channel (\*1)" value.

After this message was received, the parameter is decreased referring to the "None Registered Parameter Number."

The VM-7200/7100 doesn't transmit this message.

Status	Second	Third
BnH	61H	00H

n = MIDI Channel No.: 0H - FH (ch.1 - ch.16)

Decrement the effect parameter selected with NRPN.

(\*1) See "2. Address Map for Data Transfer" section.

## ●Pitch bend Change

Status	Second	Third
EnH	lH	mmH

n = MIDI Channel No.: 0H - FH (ch.1 - ch.16)

mm, l = Pitch Bend Value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

Set the pitch bend value of third byte to the parameter which is designated with the MIDI channel number and the pitch bend value of the second byte.

## Parameters and Pitch bend Messages

Message	Parameter Contents and remarks
E0H 00H mmH	Input Master Fader Level - CH 1
:	:
:	(Cascade Master Unit)
E0H 2FH mmH	MultiIn Master Fader Level - CH 24
E0H 30H mmH	Main Master Level
:	:
:	(Cascade Master Unit)
E0H 31H mmH	Input Main Send Pan - CH 1
:	:
:	(Cascade Master Unit)
E0H 60H mmH	MultiIn Main Send Pan - CH 24
E0H 61H mmH	Main Master Balance
:	:
:	(Cascade Master Unit)
E0H 62H mmH	Pre Amp Input Gain - CH1
:	:
:	(Cascade Master Unit)
E0H 79H mmH	Pre Amp Input Gain - CH24
E0H 7AH mmH	(Reserved)
E1H 00H mmH	Input Bus 1 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 2FH mmH	MultiIn Bus 1 Send Level - CH24
E1H 30H mmH	Input Bus 2 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 5FH mmH	MultiIn Bus 2 Send Level - CH24
E1H 60H mmH	Input Bus 3 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 9FH mmH	MultiIn Bus 3 Send Level - CH24
E1H 10H mmH	Input Bus 4 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 3FH mmH	MultiIn Bus 4 Send Level - CH24
E1H 40H mmH	Input Bus 5 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 6FH mmH	MultiIn Bus 5 Send Level - CH24
E1H 70H mmH	Input Bus 6 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 1FH mmH	MultiIn Bus 6 Send Level - CH24
E1H 20H mmH	Input Bus 7 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 4FH mmH	MultiIn Bus 7 Send Level - CH24
E1H 50H mmH	Input Bus 8 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 7FH mmH	MultiIn Bus 8 Send Level - CH24
E1H 90H mmH	Input Bus 9 Send Level - CH1
:	:
:	(Cascade Master Unit)
E1H 2FH mmH	MultiIn Bus 9 Send Level - CH24
E1H 30H mmH	Input Bus 10 Send Level - CH1
:	:
:	(Cascade Master Unit)

E4H 5FH mmH	MultiIn Bus 10 Send Level - CH24	
E4H 60H mmH	Input Bus 11 Send Level - CH1	
		(Cascade Master Unit)
E5H 0FH mmH	MultiIn Bus 11 Send Level - CH24	
E5H 10H mmH	Input Bus 12 Send Level - CH1	
		(Cascade Master Unit)
E5H 3FH mmH	MultiIn Bus 12 Send Level - CH24	
E5H 40H mmH	Bus Master Fader Level - BUS1	
		(Cascade Master Unit)
E5H 4EH mmH	Bus Master Fader Level - BUS12	
E5H 4CH mmH	(Reserved)	
E6H 00H mmH	Input Master Fader Level - CH 1	
		(Cascade Slave Unit)
E6H 2FH mmH	MultiIn Master Fader Level - CH 24	
E6H 30H mmH	Main Master Level	
		(Cascade Slave Unit)
E6H 31H mmH	Input Main Send Pan - CH 1	
		(Cascade Slave Unit)
E6H 60H mmH	MultiIn Main Send Pan - CH 24	
E6H 61H mmH	Main Master Balance	
		(Cascade Slave Unit)
E6H 62H mmH	Pre Amp Input Gain - CH1	
		(Cascade Slave Unit)
E6H 79H mmH	Pre Amp Input Gain - CH24	
E6H 7AH mmH	(Reserved)	
E6H 80H mmH	Input Bus 1 Send Level - CH1	
		(Cascade Slave Unit)
E6H 2FH mmH	MultiIn Bus 1 Send Level - CH24	
E6H 39H mmH	Input Bus 2 Send Level - CH1	
		(Cascade Slave Unit)
E6H 5FH mmH	MultiIn Bus 2 Send Level - CH24	
E6H 60H mmH	Input Bus 3 Send Level - CH1	
		(Cascade Slave Unit)
E6H 0FH mmH	MultiIn Bus 3 Send Level - CH24	
E6H 10H mmH	Input Bus 4 Send Level - CH1	
		(Cascade Slave Unit)
E6H 3FH mmH	MultiIn Bus 4 Send Level - CH24	
E6H 40H mmH	Input Bus 5 Send Level - CH1	
		(Cascade Slave Unit)
E6H 6FH mmH	MultiIn Bus 5 Send Level - CH24	
E6H 70H mmH	Input Bus 6 Send Level - CH1	
		(Cascade Slave Unit)
E6H 1FH mmH	MultiIn Bus 6 Send Level - CH24	
E6H 20H mmH	Input Bus 7 Send Level - CH1	
		(Cascade Slave Unit)
E6H 4FH mmH	MultiIn Bus 7 Send Level - CH24	
E6H 50H mmH	Input Bus 8 Send Level - CH1	
		(Cascade Slave Unit)

E6H 7FH mmH	MultiIn Bus 8 Send Level - CH24	
E6H 00H mmH	Input Bus 9 Send Level - CH1	
		(Cascade Slave Unit)
E6H 2FH mmH	MultiIn Bus 9 Send Level - CH24	
E6H 30H mmH	Input Bus 10 Send Level - CH1	
		(Cascade Slave Unit)
E6H 5FH mmH	MultiIn Bus 10 Send Level - CH24	
E6H 60H mmH	Input Bus 11 Send Level - CH1	
		(Cascade Slave Unit)
E6H 0FH mmH	MultiIn Bus 11 Send Level - CH24	
E6H 10H mmH	Input Bus 12 Send Level - CH1	
		(Cascade Slave Unit)
E6H 3FH mmH	MultiIn Bus 12 Send Level - CH24	
E6H 40H mmH	Bus Master Fader Level - BUS1	
		(Cascade Slave Unit)
E6H 4EH mmH	Bus Master Fader Level - BUS12	
E6H 4CH mmH	(Reserved)	

■ System Exclusive Message

Status	Data Bytes	Status
FOH	iiH, ddH, ..., eeH	F7H
Byte	Description	
FOH	Status of System Exclusive Message	
iiH	Manufacturer ID	
	41H Roland's Manufacturer ID	
	7EH Universal Non Realtime Message	
	7FH Universal Realtime Message	
ddH	Data: 00H - 7FH (0-127)	
eeH	Data	
F7H	EOX (End of System Exclusive Message)	

The VM-7200/7100 can transfer and receive the internal parameters information using system exclusive messages, and also can be controlled by the external devices using system exclusive messages.

The VM-7200/7100 can transmit and receive the System Exclusive messages such as Universal System Exclusive messages, Data Request (RQ1) and Data Set (DT1).

○ About Model ID

For Data Request (RQ1) and Data Set (DT1), the VM-7200/7100 uses 00H 1EH as a Model ID.

○ About Device ID

System Exclusive messages are not assigned to any particular MIDI channel. Instead, they have their own special control parameter called device ID. The Roland system exclusive messages use device IDs to specify multiple VM-7200/7100 units. The VM-7200/7100 sends system exclusive messages using the value set at "MIDI System Exclusive Device ID (\*1)," and receives the system exclusive messages whose device ID is same as its device ID and 7FH.

● Universal System Exclusive Message

○ INQUIRY MESSAGE

Identity Request

Status	Data Byte	Status
FOH	7EH, Dev, 06H, 01H	F7H

Byte	Description
FOH	Status of System Exclusive Message
7EH	Universal System Exclusive Message Non Realtime Header
Dev	Device ID (or 7FH)

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06H	General Information (sub ID #1)
01H	Identify Request (sub ID #2)
F7H	EOX (End of System Exclusive Message)

The message is used to request the particular information of the VM-7200/7100. If this message is received right after the power is on, Device ID of the received message is set to the Device ID of the VM-7200/7100.

If the first received message's Device ID is 7FH, the VM-7200/7100's Device ID is set to the 10H (cascade slave processor = 11H), default value.

The VM-7200/7100 does not transmit this message.

If the VM-7200/7100 received the message and the device ID of the received message is same as its device ID or 7FH, the VM-7200/7100 transmits the following Identity Reply message.

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 02H, 41H, 1EH, 01H, nnH, 00H, vvH, 00H, ssH, ssH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7EH	Universal System Exclusive Message Non-Realtime Header
Dev	Device ID
06H	General Information (sub ID #1)
02H	Identify Request (sub ID #2)
41H	Manufacturer ID (Roland)
1EH 01H	Device Family Code (VM-7200/7100)
nnH 00H	Device Family No. (VM-xxxxx)
0:	Reserved, 1:VM-7100, 2:VM-C7100, 3:VM-7200, 4:VM-C7200
vvH 00H	Option Available No.
0 0 x x x - x x x x	
	Effect Board A
	Effect Board B
	Effect Board C
	R-BUS Board
	Cascade Board
	7100/7200

ssH ssH	Software Revision Level
F7H	EOX (End of System Exclusive Message)

## MIDI Machine Control Commands

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, aaH, ..., bbH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
aaH	Command
:	:
bbH	Command
F7H	EOX (End of System Exclusive Message)

(\*) see "3. MIDI Machine Control" section

## MIDI Machine Control Responses

Status	Data Bytes	Status
F0H	7FH, Dev, 07H, aaH, ..., bbH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID
07H	MMC Response Message
aaH	Response
:	:
bbH	Response
F7H	EOX (End of System Exclusive Message)

(\*) see "3. MIDI Machine Control" section

## ●Data Transfer (RQ1, DT1)

### ○Data Request (RQ1)

Status	Data Bytes	Status
F0H	41H, Dev, 00H, 1EH, 11H, aa1, bb1, cc1, ss1, ss1, Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 1EH	Model ID (V-Mixer)
11H	Command ID (RQ1)
aaH	Address MSB
bbH	Address MID
ccH	Address LSB
ssH	Size MSB
ssH	Size MID
ssH	Size LSB
Sum	Check Sum
F7H	EOX (End of System Exclusive Message)

The message is used to request data to the VM-7200/7100.

The VM-7200/7100 does not transmit this message.

The VM-7200/7100 transmits the requested data using Data Set (DT1) under following condition when it received the message.

- 1 The requested address correspond to the specified parameter base address of the VM-7200/7100.
- 2 The requested size is over 1 byte.

### ○Data Set (DT1)

Status	Data Bytes	Status
F0H	41H, Dev, 00H, 0EH, 12H, aaH, bbH, ccH, ddH, ..., ee1, Sum	F7H

Byte	Description
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 1EH	Model ID (V-Mixer)
12H	Command ID (DT1)
aaH	Address MSB
bbH	Address MID
ccH	Address LSB
ddH	Data
:	:
eeH	Data
Sum	Check Sum
F7H	EOX (End of System Exclusive Message)

### The message is received under the following condition.

If VM-Link is not connected, and the device ID on the message is same as that of the receive device, and the address on the message correspond to the specified parameter base address, the received data are stored from the specified parameter base address.

If the interval of received messages is shorter than 20 msec, the VM-7200/7100 can not work the receive message procedure correctly.

### The message is transmitted under the following condition.

When the VM-7200/7100 transmit the data on the requested parameter after receiving the Data Request message (RQ1).

See "2. Data Transfer Address Map" for more details of the transfer parameters.

## 2. Data Transfer Address Map

The each address value is expressed as a 7bit hex number.

Address	MSB	MID	LSB
None Registered	0000 0000	0000 0000	0111 1111
Parameter Number	00	MM	LL
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7 Bit Hex	AA	BB	CC

### ■MIDI Data - Mixer EQ Freq Table

Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)
00H	16.0	20H	100	40H	630	60H	4.00k
01H	17.0	21H	106	41H	670	61H	4.22k
02H	18.0	22H	112	42H	710	62H	4.50k
03H	19.0	23H	120	43H	750	63H	4.73k
04H	20.0	24H	128	44H	800	64H	5.00k
05H	21.0	25H	133	45H	840	65H	5.30k
06H	22.4	26H	140	46H	900	66H	5.60k
07H	23.7	27H	150	47H	944	67H	6.00k
08H	25.0	28H	160	48H	1.00k	68H	6.30k
09H	26.6	29H	170	49H	1.06k	69H	6.70k
0AH	28.0	2AH	180	4AH	1.12k	6AH	7.10k
0BH	30.0	2BH	190	4BH	1.20k	6BH	7.50k
0CH	31.5	2CH	200	4CH	1.25k	6CH	8.00k
0DH	33.5	2DH	210	4DH	1.33k	6DH	8.40k
0EH	35.5	2EH	224	4EH	1.40k	6EH	9.00k
0FH	37.6	2FH	237	4FH	1.50k	6FH	9.44k
10H	40.0	30H	250	50H	1.60k	70H	10.0k
11H	42.2	31H	266	51H	1.70k	71H	10.6k
12H	45.0	32H	280	52H	1.80k	72H	11.2k
13H	47.3	33H	300	53H	1.90k	73H	12.0k
14H	50.0	34H	315	54H	2.00k	74H	12.5k
15H	53.0	35H	335	55H	2.10k	75H	13.3k
16H	56.0	36H	355	56H	2.24k	76H	14.0k
17H	60.0	37H	376	57H	2.37k	77H	15.0k
18H	63.0	38H	400	58H	2.50k	78H	16.0k
19H	67.0	39H	422	59H	2.66k	79H	17.0k
1AH	71.0	3AH	450	5AH	2.80k	7AH	18.0k
1BH	75.6	3BH	473	5BH	3.00k	7BH	19.0k
1CH	80.0	3CH	500	5CH	3.15k	7CH	20.0k
1DH	84.0	3DH	530	5DH	3.35k	7DH	21.0k
1EH	90.0	3EH	560	5EH	3.55k	7EH	22.4k
1FH	94.4	3FH	600	5FH	3.76k	7FH	23.7k

### ■MIDI Data - Mixer EQ Quality Table

Data	Q	Data	Q	Data	Q
00H	0.355	10H	2.24	20H	14.0
01H	0.400	11H	2.50	21H	16.0
02H	0.450	12H	2.80		
03H	0.500	13H	3.15		
04H	0.560	14H	3.55		
05H	0.630	15H	4.00		
06H	0.710	16H	4.50		
07H	0.800	17H	5.00		
08H	0.900	18H	5.60		
09H	1.00	19H	6.30		
0AH	1.12	1AH	7.10		
0BH	1.25	1BH	8.00		
0CH	1.40	1CH	9.00		
0DH	1.60	1DH	10.0		
0EH	1.80	1EH	11.2		
0FH	2.00	1FH	12.5		

### ■MIDI Data - Mixer EQ Gain Table

Data	Gain
00H	32.0dB
01H	-31.5dB
02H	-31.0dB
:	:
:	:
3EH	-1.0dB
3FH	-0.5dB
40H	0.0dB
41H	+0.5dB
42H	+1.0dB
:	:
:	:
7EH	-31.0dB
7FH	-31.5dB

HFD GAIN: 04H (-30.0 dB) - 40H (0.0 dB) - 4CH (+6.0 dB)  
 LFD GAIN: 04H (-30.0 dB) - 40H (0.0 dB) - 4CH (+6.0 dB)  
 EQ GAIN: 22H (-15.0 dB) - 40H (0.0 dB) - 5EH (+15.0 dB)

### ■MIDI Data - EXP/CMP Ratio Table

Data	RATIO
00H	1:1.0 (OFF)
01H	1:1.1
02H	1:1.2
03H	1:1.4
04H	1:1.6
05H	1:1.8
06H	1:2.0
07H	1:2.5
08H	1:3.1
09H	1:4.0
0AH	1:5.6
0BH	1:8.0
0CH	1:16
0DH	1:INF

### ■Parameter Address Block

<Model ID = 00H 1EH>

Start	Block
00 00 00	System Block 1-1
00 10 00	Mixer Block 1-2
:	:
:	:
00 50 00	Effect Block 1-3
00 60 00	(Reserved)
:	:
7F 7F 7F	

#### ●1-1. System Block

Offset	adrs	Data	Contents and remarks
00 00 00	0aaaaaa		Software Revision Level (*1)
00 00 01#	0bbbbbbb		
00 00 02	00 - 3F		Option Available (*1)
		0 0 x x . x x x x	
			+ ← Effect Board A
			+ ← Effect Board B

# MIDI Implementation

Offset	Adrs	Data	Contents and remarks
00 00 03	00 - 7F		Error Message (*3)
00 00 04	00 - 02		Sampling Frequency 48,44.1,32kHz
00 00 05	00		(Reserved)
00 00 06	00 - 06		Word Clock Source Int.R-BUS1,,,3, Cascade,WordClkIn,DigIn
00 00 07	00 - 01		Word Clock Terminator Switch Off,On
00 00 08	00 - 01		Digital Audio Input Coaxial,XLR-bal
00 00 09	00 - 01		R-BUS I/F type -1 (*1) Off,DIF-AT
00 00 0A	00 - 01		R-BUS I/F type -2 (*1) Off,DIF-AT
00 00 0B	00 - 01		R-BUS I/F type -3 (*1) Off,DIF-AT
00 00 0C	00 - 01		MIDI OUT/THRU Sw Out,THRU
00 00 0D	00 - 01		MIDI Level Meter Tx Sw Off,On
00 00 0E	00 - 0F		MIDI Level Meter Channel 1,,,16
00 00 0F	00 - 02		MIDI Control Type (*2) Off,C.C.,NRPN
00 00 10	00 - 0F		MIDI Control Channel (*2) 1,,,16
00 00 11	00 - 01		MIDI C.C. Type Off,Mono,Multi
00 00 12	00 - 1F		MIDI System Exclusive Device ID 1,,,32
00 00 13	00 - 03		MIDI Control Change Type Assign C.C.# -0 Off,Level,Sw,Par
00 01 12	00 - 03		MIDI Control Change Type Assign C.C.# -127
00 01 13	00 - 3F		MIDI Control Change Channel Assign C.C.# -0 Input1,,,24,MultiIn1,,,24,Bus1,,,8,Master
00 02 12	00 - 3F		MIDI Control Change Channel Assign C.C.# -127
00 02 13	00 - 3F		Meter Unit Select Unit0,Unit1... 7F=Off
00 02 14	00 - 3F		MTC Unit Select Unit0,Unit1... 7F=Off
00 02 15	00 - 02		Cascade Mode (*1) Off,Master,Slave
00 02 16	00 - 01		Digital Audio Output - Channel Status Type Type1, Type2-Form1
00 02 17	00 - 01		Digital Audio Copy Protect Off, On
00 02 18	00		(Reserved)

(\*1) These parameters are read only.

(\*2) These parameters are set by only Exclusive message (DT1).

(\*3) These parameters are read only. If errata are occurred, the VM-7200A^7100 transmit the message.

## ●1-2. Mixer Block

Offset	Adrs	Data	Contents and remarks
00 00 00	00 - 01		Pre Amp Param. -1 (Ch 1) 2-1
00 00 02	00 - 02		Pre Amp Param. -2 (Ch 2)

Offset	Adrs	Data	Contents and remarks
00 00 2E	00 - 24		Pre Amp Param. -24 (Ch 24)
00 00 30	00 - 01		Input Param. -1 (Ch 1) 2-3
00 01 26	00 - 02		Input Param. -2 (Ch 2)
00 14 40	00 - 24		Input Param. -24 (Ch 24)
00 15 36	00 - 01		MultiIn Param. -1 (Ch 1) 2-3
00 16 20	00 - 02		MultiIn Param. -2 (Ch 2)
00 29 40	00 - 24		MultiIn Param. -24 (Ch 24)
00 2A 30	00 - 01		Talk Back Param. 2-4
00 2B 10	00 - 01		Bus 1-12 Param. -1 (BUS 1) 2-5
00 2B 20	00 - 02		Bus 1-12 Param. -2 (BUS 2)
00 2C 40	00 - 12		Bus 1-12 Param. -12 (BUS 12)
00 2C 50	00 - 01		Bus 1-8 Param. -1 (BUS 1) 2-6
00 2D 08	00 - 02		Bus 1-8 Param. -2 (BUS 2)
00 2F 58	00 - 08		Bus 1-8 Param. -8 (BUS 8)
00 30 10	00 - 01		Output Param. 2-7
00 30 60	00 - 01		Solo Param. 2-8
00 31 20	00 - 01		Fader Group Master Param. 2-9
00 31 40	00 - 01		Effect Section Param. -1 (FX1) 2-10
00 31 4A	00 - 02		Effect Section Param. -2 (FX2)
00 32 06	00 - 08		Effect Section Param. -8 (FX8)
00 32 30	00 - 01		Master Effect Section Param. 2-11
00 32 40	00 - 01		Cascade Param. 2-12
00 32 60	00 - 01		Dither Param. 2-13
00 33 00	00 - 01		GEN/OSC Param. 2-14
00 33 20	00 - 01		Level Meter/Analyzer Param. 2-15
00 33 30	00 - 01		Misc. Param. 2-16
00 33 40	00		(Reserved)

## ○2-1. Pre Amp Parameter

Offset	Adrs	Data	Contents and remarks
00 00 00	00 - 01		Pre Amp Phantom Power Sw Off,On
00 00 01	00 - 44		Pre Amp Input Gain +4dB(00) to -64dB(44)
00 00 02	00		(Reserved)

## ○2-2. Input Parameter

Offset	Adrs	Data	Contents and remarks
00 00 00	00 - 01		Input Channel Link Sw Off,On
00 00 01	00 - 17		Input Group Fader Assign Ch1,,,Ch24 {40 - 57} bit6 : 0:Off,1:On
00 00 02	00 - 17		Input Select Ch1,,,Ch24, {40 - 57} DigitalInL,DigitalInR,ConsoleInL,ConsoleInR bit6 : 0:Off,1:On

00 00 03	28 - 46	Input ATT	(0dB:64[40H]) -24dB...+6dB
00 00 04	00 - 01	Input Phase Sw	Norm,Inv
00 00 05	00 - 01	Input Phase Delay Sw	Off,On
00 00 06	0aaaaaa	Input Phase Delay Time (*4)	
00 00 07#	0bbbbbb		0...14400sample
00 00 08	0aaaaaa	Input Feedback Delay Time (*4)	
00 00 09#	0bbbbbb		2...14400sample
00 00 0A	00 - 01	Input Feedback Delay Sw	Off,On
00 00 0B	00 - 7F	Input Feedback Delay Fb Level	0...127
00 00 0C	00 - 01	Input Feedback Delay Fb Phase	Norm,Inv
00 00 0D	00 - 7F	Input Feedback Delay Eff Level	0...127
00 00 0E	00 - 01	Input Feedback Delay Eff Phase	Norm,Inv
00 00 0F	00 - 7F	Input Feedback Delay Dir Level	0...127
00 00 10	04 - 4C	Input Feedback Delay HFD Gain (*2)	-30.0dB...+6.0dB
00 00 11	2C - 7C	Input Feedback Delay HFD Freq (*1)	200...20kHz
00 00 12	04 - 4C	Input Feedback Delay LFD Gain (*2)	-30.0dB...+6.0dB
00 00 13	04 - 54	Input Feedback Delay LFD Freq (*1)	20...2kHz
00 00 14	00 - 01	Input HPF Sw	Off,On
00 00 15	04 - 54	Input HPF Cut Off Freq (*1)	20...2kHz
00 00 16	00 - 01	Input EQ Sw	Off,On
00 00 17	22 - 5E	Input EQ Hi Gain (*2)	-15.0dB...+15.0dB
00 00 18	48 - 7C	Input EQ Hi Freq (*1)	1k...20kHz
00 00 19	22 - 5E	Input EQ HiMid Gain (*2)	-15.0dB...+15.0dB
00 00 1A	38 - 7C	Input EQ HiMid Freq (*1)	400...20kHz
00 00 1B	00 - 21	Input EQ HiMid Q (*3)	0.355...16.0
00 00 1C	00 - 05	Input EQ LoMid Type	Off,LPF,BPF,HPF, Notch,Peak
00 00 1D	22 - 5E	Input EQ LoMid Gain (*2)	-15.0dB...+15.0dB
00 00 1E	04 - 5C	Input EQ LoMid Freq (*1)	20...8kHz
00 00 1F	00 - 21	Input EQ LoMid Q (*3)	0.355...16.0
00 00 20	00 - 7F	Input EQ LoMid Resonance	0...127
00 00 21	22 - 5E	Input EQ Lo Gain (*2)	-15.0dB...+15.0dB
00 00 22	04 - 54	Input EQ Lo Freq (*1)	20...2kHz
00 00 23	00 - 01	Input Mute Sw	Norm,Mute
00 00 24	00 - 7F	Input Master Fader Level	0...127
00 00 25	00 - 01	Input Main Send Sw	Off,On
00 00 26	01 - 7F	Input Main Send Pan	L63...R63
00 00 27	00 - 02	Input Cue Send Sw	PreEQ,PreFader,PostFader bit6 : 0:Off,1:On (40 - 42)
00 00 28	00 - 7F	Input Cue Send Level	0...127
00 00 29	01 - 7F	Input Cue Send Pan	L63...R63

00 00 2A	00 - 01	Input Cue Send Pan Slave	Off,On
00 00 2B	00 - 02	Input Bus 1 Send Sw	PreEQ,PreFader,PostFader (40 - 42) bit6 : 0:Off,1:On
00 00 36	06 - 02	Input Bus 12 Send Sw	PreEQ,PreFader,PostFader (40 - 42) bit6 : 0:Off,1:On
00 00 37	00 - 7F	Input Bus 1 Send Level	0...127
00 00 42	00 - 7F	Input Bus 12 Send Level	
00 00 43	01 - 7F	Input Bus 1 Send Pan	L63...R63
00 00 4E	01 - 7F	Input Bus 12 Send Pan	
00 00 4F	00 - 01	Input Bus 1 Send Pan Slave	Off,On
00 00 5A	00 - 01	Input Bus 12 Send Pan Slave	
00 00 5B	00 - 02	Patch Bay Send Sw	PreEQ,PreFader,PostFader (40 - 42) bit6 : 0:Off,1:On
00 00 5C	00	(Reserved)	

- (\*1) See "MIDI Data - Mixer EQ Freq Table."
- (\*2) See "MIDI Data - Mixer EQ Gain Table."
- (\*3) See "MIDI Data - Mixer EQ Quality Table."
- (\*4) (Phase Delay Time) + (Feedback Delay Time) should be 15000 or less.

**02-3. Multilin Parameter**

Offset	adrs	Data	Contents and remarks
	00 00 00	00 - 01	Multilin Channel Link Sw Off,On
	00 00 01	00 - 17 (40 - 57)	Multilin Group Fader Assign Ch1...Ch24 bit6 : 0:Off,1:On
	00 00 02	00 - 17 (40 - 57)	Multilin Select Tr1...Tr24 bit6 : 0:Off,1:On
	00 00 03	28 - 46	Multilin ATT (0dB:64[40H]) -24dB...+6dB
	00 00 04	00 - 01	Multilin Phase Sw Norm,Inv
	00 00 05	00 - 01	Multilin Phase Delay Sw Off,On
	00 00 06	0aaaaaa	Multilin Phase Delay Time (*4)
	00 00 07#	0bbbbbb	0...14400sample
	00 00 08	0aaaaaa	Multilin Feedback Delay Time (*4)
	00 00 09#	0bbbbbb	2...14400sample
	00 00 0A	00 - 01	Multilin Feedback Delay Sw Off,On
	00 00 0B	00 - 7F	Multilin Feedback Delay Fb Level 0...127
	00 00 0C	00 - 01	Multilin Feedback Delay Fb Phase Norm,Inv
	00 00 0D	00 - 7F	Multilin Feedback Delay Eff Level 0...127
	00 00 0E	00 - 01	Multilin Feedback Delay Eff Phase Norm,Inv
	00 00 0F	00 - 7F	Multilin Feedback Delay Dir Level 0...127
	00 00 10	04 - 4C	Multilin Feedback Delay HFD Gain (*2) -30.0dB...+6.0dB
	00 00 11	2C - 7C	Multilin Feedback Delay HFD Freq (*1) 200...20kHz
	00 00 12	04 - 4C	Multilin Feedback Delay LFD Gain (*2) -30.0dB...+6.0dB



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00 00 13	04 - 54	MultiIn Feedback Delay LFD Freq (*1)	20...2kHz
00 00 14	00 - 01	MultiIn HPF Sw	Off,On
00 00 15	04 - 54	MultiIn HPF Cut Off Freq (*1)	20...2kHz
00 00 16	00 - 01	MultiIn EQ Sw	Off,On
00 00 17	22 - 5E	MultiIn EQ Hi Gain (*2)	-15.0dB...+15.0dB
00 00 18	48 - 7C	MultiIn EQ Hi Freq (*1)	1k...20kHz
00 00 19	22 - 5E	MultiIn EQ HiMid Gain (*2)	-15.0dB...+15.0dB
00 00 1A	38 - 7C	MultiIn EQ HiMid Freq (*1)	400...20kHz
00 00 1B	00 - 21	MultiIn EQ HiMid Q (*3)	0.355...16.0
00 00 1C	00 - 05	MultiIn EQ LoMid Type	Off,LPF,BPF,HPF, Notch,Peak
00 00 1D	22 - 5E	MultiIn EQ LoMid Gain (*2)	-15.0dB...+15.0dB
00 00 1E	04 - 6C	MultiIn EQ LoMid Freq (*1)	20...9kHz
00 00 1F	00 - 21	MultiIn EQ LoMid Q (*3)	0.355...16.0
00 00 20	00 - 7F	MultiIn EQ LoMid Resonance	0...127
00 00 21	22 - 5E	MultiIn EQ Lo Gain (*2)	-15.0dB...+15.0dB
00 00 22	04 - 54	MultiIn EQ Lo Freq (*1)	20...2kHz
00 00 23	00 - 01	MultiIn Mute Sw	Norm,Mute
00 00 24	00 - 7F	MultiIn Master Fader Level	0...127
00 00 25	00 - 01	MultiIn Main Send Sw	Off,On
00 00 26	01 - 7F	MultiIn Main Send Pan	L63...R63
00 00 27	00 - 02 (40 - 42)	MultiIn Cue Send Sw	PreEQ,PreFader,PostFader bit6 : 0:Off,1:On
00 00 28	00 - 7F	MultiIn Cue Send Level	0...127
00 00 29	01 - 7F	MultiIn Cue Send Pan	L63...R63
00 00 2A	00 - 01	MultiIn Cue Send Pan Slave	Off,On
00 00 2B	00 - 02 (40 - 42)	MultiIn Bus 1 Send Sw	PreEQ,PreFader,PostFader bit6 : 0:Off,1:On
00 00 36	00 - 02 (40 - 42)	MultiIn Bus 12 Send Sw	PreEQ,PreFader,PostFader bit6 : 0:Off,1:On
00 00 37	00 - 7F	MultiIn Bus 1 Send Level	0...127
00 00 42	00 - 7F	MultiIn Bus 12 Send Level	
00 00 43	01 - 7F	MultiIn Bus 1 Send Pan	L63...R63
00 00 4E	01 - 7F	MultiIn Bus 12 Send Pan	
00 00 4F	00 - 01	MultiIn Bus 1 Send Pan Slave	Off,On
00 00 5A	00 - 01	MultiIn Bus 12 Send Pan Slave	
00 00 5B	00	(Reserved)	

(\*1) See "MIDI Data - Mixer EQ Freq Table."  
 (\*2) See "MIDI Data - Mixer EQ Gain Table."  
 (\*3) See "MIDI Data - Mixer EQ Quality Table."  
 (\*4) (Phase Delay Time) + (Feedback Delay Time) should be 15000 or less.

## 02-4. Talk Back Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01	Talk Back Sw	Off,On
00 00 01	00 - 01	Talk Back Function Select	Talkback,Slate
00 00 02	00 - 7F	Talk Back Level	0...127
00 00 03	00 - 01	Talk Back To Main	Off,On
00 00 04	00 - 01	Talk Back To Cue	Off,On
00 00 05	00 - 01	Talk Back To Bus 1	Off,On
00 00 10	00 - 01	Talk Back To Bus 12	
00 00 11	00 - 01	Talk Back To Multi 1	Off,On
00 00 2E	00 - 01	Talk Back To Multi 24	
00 00 29	00 - 7F	Slate Level	0...127
00 00 2A	00 - 01	Slate To Main	Off,On
00 00 2B	00 - 01	Slate To Cue	Off,On
00 00 2C	00 - 01	Slate To Bus 1	Off,On
00 00 37	00 - 01	Slate To Bus 12	
00 00 38	00 - 01	Slate To Multi 1	Off,On
00 00 4F	00 - 01	Slate To Multi 24	
00 00 50	00	(Reserved)	

## 02-5. BUS 1-12 Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01	Bus Link Sw	Off,On
00 00 01	00 - 17 (40 - 57)	Bus Group Fader Assign	Ch1...Ch24 bit6 : 0:Off,1:On
00 00 02	00 - 01	Bus Mode (*1)	Int,Ext
00 00 03	28 - 40	Bus APT	-24dB...0dB
00 00 04	00 - 01	Bus Mute Sw	Norm,Mute
00 00 05	00 - 7F	Bus Master Fader Level	0...127
00 00 06	01 - 7F	Bus Master Fader Balance	L63...R63
00 00 07	00 - 01	Bus Main Send Sw	Off,On
00 00 08	01 - 7F	Bus Main Send Pan	L63...R63
00 00 09	00 - 01	Bus Cue Send Sw	Off,On
00 00 0A	00 - 7F	Bus Cue Send Level	0...127
00 00 0B	01 - 7F	Bus Cue Send Pan	L63...R63
00 00 0C	00 - 01	Bus Cue Send Pan Slave	Off,On
00 00 0D	00	(Reserved)	

(\*1) Settings to the buses 9-12 are invalid.

(\*1) If you set it to "Int." no audio is output from the Flex Bus Out. Even if you select "MultiOut / Assignable Out" for the Flex Bus Out, which is set to "Int."

02-6. BUS 1-8 Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01		Bus to Bus 1 Send Sw Off,On
00 00 0B	00 - 01		Bus to Bus 12 Send Sw
00 00 0C	00 - 7F		Bus to Bus 1 Send Level 0...127
00 00 17	00 - 7F		Bus to Bus 12 Send Level
00 00 18	01 - 7F		Bus to Bus 1 Send Pan L63...R63
00 00 23	01 - 7F		Bus to Bus 12 Send Pan
00 00 24	00 - 01		Bus to Bus 1 Send Pan Slave Off,On
00 00 2F	00 - 01		Bus to Bus 12 Send Pan Slave
00 00 30	00		(Reserved)

02-7. Output Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00		(Reserved)
00 00 01	00		(Reserved)
00 00 02	00		(Reserved)
00 00 03	00 - 7F		Control Room Master Level 0...127
00 00 04	01 - 7F		Control Room Master Balance L63...R63
00 00 05	00 - 25 {40 - 65}		Control Room Source CH1...24,Bus1...12,Main,Cue bit6 : 0:Off,1:On
00 00 06	00 - 01		Control Room Mono Sw Off,On
00 00 07	00 - 01		Control Room Dim Sw Off,On
00 00 08	00 - 7F		Control Room Dim Level 0...127
00 00 09	28 - 40		Main Bus ATT -24dB...0dB
00 00 0A	00 - 01		Main Master Mute Norm.Mute
00 00 0B	00 - 7F		Main Master Level 0...127
00 00 0C	01 - 7F		Main Master Balance L63...R63
00 00 0D	28 - 40		Cue Bus ATT -24dB...0dB
00 00 0E	00 - 01		Cue Master Mute Norm.Mute
00 00 0F	00 - 7F		Cue Master Level 0...127
00 00 10	01 - 7F		Cue Master Balance L63...R63
00 00 11	00 - 7F		Multi Output Level 1 0...127
00 00 28	00 - 7F		Multi Output Level 24
00 00 29	00 - 29 {40 - 69}		Multi Output Assign 1 CH1...24,Bus1...12 MainL,MainR,CueL,CueR,MonL,MonR bit6 : 0:Off,1:On
00 00 40	00 - 29 {40 - 69}		Multi Output Assign 24 bit6 : 0:Off,1:On

00 00 41	00 - 01		All Mute Switch Norm.Mute
00 00 42	00 - 01		Monitor Out Line Switch Off,On
00 00 43	00		(Reserved)

02-8. Solo Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 7F		Solo Level 0...127
00 00 01	00 - 03		Solo Sw Source PreEQ, PFL, AFL, INPLACE
00 00 02	00 - 01		Solo Sw Off,On
00 00 03	00 - 01		Solo Sw Input Channel -1 Off,On
00 00 1A	00 - 01		Solo Sw Input Channel -24
00 00 1B	00 - 01		Solo Sw MultiIn Channel -1 Off,On
00 00 32	00 - 01		Solo Sw MultiIn Channel -24
00 00 3A	00 - 01		Solo Sw Bus -1 (*1) Off,On
00 00 3E	00 - 01		Solo Sw Bus -12 (*1)
00 00 3F	00		(Reserved)

(\*1) When the Bus Mode 1-8 of "2-5.Bus 1-12 Parameter" is set to "Ext," Solo bus 1-8 is invalid if the Solo Switch Source is not set to "INPLACE."

02-9. Fader Group Master Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 7F		Fader Group Master -1 0...127
00 00 17	00 - 7F		Fader Group Master -24
00 00 18	00		(Reserved)

02-10. Effect Section Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 00		(Reserved)
00 00 01	00 - 7F		FX Lch Send Level 0...127
00 00 02	00 - 7F		FX Lch Return Level 0...127
00 00 03	00 - 03		FX Lch Insert Location (MSB) Off, Input PreEQ, Input PostEQ, MultiIn PreEQ, MultiIn PostEQ, SndRtn, IntBus, ExtBus, Main, Mon
00 00 04	00 - 17		FX Lch Insert Location (LSB) CH1--Ch24, (Bus1-12, Lch, Rch)
00 00 05	00 - 7F		FX Rch Send Level 0...127
00 00 06	00 - 7F		FX Rch Return Level 0...127
00 00 07	00 - 03		FX Rch Insert Location (MSB) Off, Input PreEQ, Input PostEQ, MultiIn PreEQ, MultiIn PostEQ, SndRtn, IntBus, ExtBus, Main, Mon

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00 00 08#   00 - 17   FX Rch Insert Location (LSB)   Ch1--ch24
(Bus1-12, Lch, Rch)
00 00 09   00   (Reserved)

Limitation condition of insert location is difference depending on the FX number and the Effect Board Select of "2-16.Misc. Parameter." Please assign the effective MSB and LSB as follows.

It is impossible to insert more than two FX to the same insert location. Please check if the insert location you wish to set is not used for other FX.

If you select SndRtn for MSB, it is automatically set to the bus of the same FX number, no matter how the LSB is set. Please set both the L and R channels of MSB with the same FX number to SndRtn.

- When you use the spectrum analyzer (when you use the algorithm 34:FFT on FX1, 3, 5 or 7), it is impossible to use FX1 L ch as the channel insert (Input PreEQ, Input PostEQ, MultiIn PreEQ or MultiIn Post EQ).

## [FX1, FX2]

Location MSB (val) :	Location LSB (val)
Off (0) :	---- ( --- )
*Input PreEQ (1) :	Ch1--Ch24 ( 0-23 )
*Input PostEQ (2) :	Ch1--Ch24 ( 0-23 )
*MultiIn PreEQ (3) :	Ch1--Ch24 ( 0-23 )
*MultiIn PostEQ (4) :	Ch1--Ch24 ( 0-23 )
SndRtn (5) :	---- ( --- )
IntBus (6) :	Bus1, Bus2 ( 0-1 )
ExtBus (7) :	Bus1--Bus12 ( 0-11 )
Main (8) :	Lch, Rch ( 0-1 )
Mon (9) :	Lch, Rch ( 0-1 )

## [FX3, FX4]

< Effect Board A Select : Input >

Location MSB (val) :	Location LSB (val)
Off (0) :	---- ( --- )
Input PreEQ (1) :	Ch1--Ch4, Ch13--Ch16 ( 0-3, 12-15 )
Input PostEQ (2) :	Ch1--Ch4, Ch13--Ch16 ( 0-3, 12-15 )
SndRtn (5) :	---- ( --- )
IntBus (6) :	Bus3, Bus4 ( 2,3 )

< Effect Board A Select : MultiIn >

Location MSB (val) :	Location LSB (val)
Off (0) :	--- ( --- )
MultiIn PreEQ (3) :	Ch1--Ch4, Ch13--Ch16 ( 0-3, 12-15 )
MultiIn PostEQ (4) :	Ch1--Ch4, Ch13--Ch16 ( 0-3, 12-15 )

## [FX5, FX6]

< Effect Board B Select : Input >

Location MSB (val) :	Location LSB (val)
Off (0) :	--- ( --- )
Input PreEQ (1) :	Ch5--Ch8, Ch17--Ch20 ( 4-7, 16-19 )
Input PostEQ (2) :	Ch5--Ch8, Ch17--Ch20 ( 4-7, 16-19 )
SndRtn (5) :	--- ( --- )
IntBus (6) :	Bus5, Bus6 ( 4,5 )

< Effect Board B Select : MultiIn >

Location MSB (val) :	Location LSB (val)
Off (0) :	--- ( --- )
MultiIn PreEQ (3) :	Ch5--Ch8, Ch17--Ch20 ( 4-7, 16-19 )
MultiIn PostEQ (4) :	Ch5--Ch8, Ch17--Ch20 ( 4-7, 16-19 )

## [FX7, FX8]

< Effect Board C Select : Input >

Location MSB (val) :	Location LSB (val)
Off (0) :	--- ( --- )
Input PreEQ (1) :	Ch9--Ch12, Ch21--Ch24 ( 8-11, 20-23 )
Input PostEQ (2) :	Ch9--Ch12, Ch21--Ch24 ( 8-11, 20-23 )
SndRtn (5) :	--- ( --- )
IntBus (6) :	Bus7, Bus8 ( 6,7 )

< Effect Board C Select : MultiIn >

Location MSB (val) :	Location LSB (val)
Off (0) :	--- ( --- )
MultiIn PreEQ (3) :	Ch9--Ch12, Ch21--Ch24 ( 8-11, 20-23 )
MultiIn PostEQ (4) :	Ch9--Ch12, Ch21--Ch24 ( 8-11, 20-23 )

## Q2-11. Master Effect Section Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 7F		Master FX Send Level 0...127
00 00 01	00 - 7F		Master FX Return Level 0...127
00 00 02	00 - 02		Master FX Insert Location Grf, Main, Mon
00 00 03	00		(Reserved)

## Q2-12. Cascade Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01		Cascade Sw Bus 1 Off, On
00 00 08	00 - 01		Cascade Sw Bus 12
00 00 0C	00 - 01		Cascade Sw Cue Off, On
00 00 0D	00 - 01		Cascade Sw Main Off, On
00 00 0E	28 - 40		Cascade ATT Bus 1 -24dB, ..0dB
00 00 19	28 - 40		Cascade ATT Bus 12
00 00 1A	28 - 40		Cascade ATT Cue -24dB, ..0dB
00 00 1B	28 - 40		Cascade ATT Main -24dB, ..0dB
00 00 1C	00		(Reserved)

## Q2-13. Dither Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 09		Dither Sw MultiOut 1 Off, 16,17,18,19,20,21,22,23,24
00 00 17	00 - 09		Dither Sw MultiOut 24
00 00 18	00		(Reserved)

## Q2-14. GEN/OSC Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01		Gen/Osc Sw Off, On
00 00 01	00 - 7F		Gen/Osc Level 0...127
00 00 02	00 - 02		Gen/Osc Waveform Pink Noise, White Noise, Sin Wave
00 00 03	00000000		Gen/Osc Frequency 20.0Hz...20.000kHz
00 00 04#	00000000		(200-200000)
00 00 05#	00000000		(200-200000)
00 00 06#	00000000		(200-200000)
00 00 07	00 - 01		Gen/Osc Send Bus 1 Off, On

00 00 12	00 - 01	Gen/Osc Send Bus 12	
00 00 13	00 - 01	Gen/Osc Send Main Lch	Off,On
00 00 14	00 - 01	Gen/Osc Send Main Rch	Off,On
00 00 15	00 - 01	Gen/Osc Send Cue Lch	Off,On
00 00 16	00 - 01	Gen/Osc Send Cue Rch	Off,On
00 00 17	00	(Reserved)	
:	:		

02-15. Level Meter / Analyzer Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 04		Level Meter Target Select input, MultiIn FlexBus, MultiOut, Analyzer
00 00 01	00 - 02		Level Meter Detect Point PreEQ, PFL, PostFader
00 00 02	00 - 29		Spectrum Analyzer Source Ch1...Ch24, Bus1...12 MainL, MainR, CueL, CueR, MonL, MonR bit6 : 0:Off, 1:On
00 00 03	00 - 01		Spectrum Analyzer Averaging Sw Norm, Exp (40 - 41) bit6 : 0:Off, 1:On
00 00 04	00 - 7F		Spectrum Analyzer Averaging Num 1...128
00 00 05	00		(Reserved)
:	:		

02-16. Misc. Parameter

Offset	adrs	Data	Contents and remarks
00 00 00	00 - 01		Cascade Delay Correct Off,On
00 00 01	00 - 01		Effect Board A Select Input, MultiIn
00 00 02	00 - 01		Effect Board F Select Input, MultiIn
00 00 03	00 - 01		Effect Board C Select Input, MultiIn
00 00 04	00 - 01		Pan Curve Type Center:-3dB(0), Center:0dB(1)
00 00 05	00 - 01		Pre Amp Gain Mode Noise Less(0), Continuous(1)
00 00 06	00		(Reserved)
:	:		

01-3. Effect Block

Basic Address

Offset	adrs	Contents and remarks
00 00 00	0aaaaaaa	Effector - 1 Algorithm aaaaaabbbbb =
00 00 01#	0bbbbbbb	0:Reverb 1:Delay 2:Stereo Delay Chorus 3:Stereo Pitch Shifter Delay 4:Vocoder 5:2ch RSS 6:Delay RSS 7:Chorus RSS 8:Guitar Multi 1 9:Guitar Multi 2 10:Guitar Multi 3 11:Vocal Multi 12:Rotary

			13:Guitar Amp Simulator
			14:Stereo Phaser
			15:Stereo Flanger
			16:Dual Comp/Limiter
			17:Gate Reverb
			18:Multi Tap Delay
			19:Stereo Multi
			20:Reverb 2
			21:Space Chorus
			22:Lo-Fi Processor
			23:4Band Parametric Equalizer
			24:10Band Graphic Equalizer
			25:Hum Canceler
			26:Vocal Canceler
			(27:Voice Transformer *1,*2)
			(28:Vocoder 2 *1,*2)
			29:Mic Simulator
			30:3Band Isolator
			31:Tape Echo 201
			32:Analog Flanger
			33:Analog Phaser
			(34:FFT *1,*2)
			35:Speaker Modeling
			(36:Mastering Tool Kit *1,*2)
			(37:31Band Graphic Equalizer *1,*2)
			38:Stereo 2Band Dynamics
			39:Dual Mono Dynamics
00 00 02	20 - 7E	Effector - 1 Name -1	(ASCII)
:	:	:	:
00 00 0D	20 - 7E	Effector - 1 Name -12	
:	:	:	:
00 00 0E	00 - 7F	Effector - 1 Parameter Area (See Below)	
:	:	:	:
00 00 7F	00 - 7F		
:	:	:	:
00 01 00	0aaaaaaa	Effector - 2 Algorithm aaaaaabbbbb =	
00 01 01#	0bbbbbbb	0:Reverb 1:Delay 2:Stereo Delay Chorus 3:Stereo Pitch Shifter Delay 4:Vocoder 5:2ch RSS 6:Delay RSS 7:Chorus RSS 8:Guitar Multi 1 9:Guitar Multi 2 10:Guitar Multi 3 11:Vocal Multi 12:Rotary 13:Guitar Amp Simulator 14:Stereo Phaser 15:Stereo Flanger 16:Dual Comp/Limiter 17:Gate Reverb 18:Multi Tap Delay 19:Stereo Multi 20:Reverb 2 21:Space Chorus 22:Lo-Fi Processor 23:4Band Parametric Equalizer 24:10Band Graphic Equalizer 25:Hum Canceler 26:Vocal Canceler (27:Voice Transformer *1,*2) (28:Vocoder 2 *1,*2) 29:Mic Simulator 30:3Band Isolator 31:Tape Echo 201 32:Analog Flanger 33:Analog Phaser (34:FFT *1,*2) 35:Speaker Modeling (36:Mastering Tool Kit *1,*2) (37:31Band Graphic Equalizer *1,*2) 38:Stereo 2Band Dynamics 39:Dual Mono Dynamics	
00 01 02	20 - 7E	Effector - 2 Name -1	(ASCII)

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00 01 0D	20 - 7E	Effector - 2 Name -12				21:Space Chorus
00 01 0E	20 - 7E	Effector - 2 Parameter Area (See Below)				22:Lo-Fi Processor
00 01 7F	20 - 7E					23:4Band Parametric Equalizer
00 02 00	0aaaaaaa	Effector - 3 Algorithm	aaaaaaabbbbbbb =			24:10Band Graphic Equalizer
00 02 01	0bbbbbbb	0:Reverb				25:Hum Canceler
		1:Delay				26:Vocal Canceler
		2:Stereo Delay Chorus				(27:Voice Transformer *1,*2)
		3:Stereo Pitch Shifter Delay				(28:Vocoder 2 *1,*2)
		4:Vocoder				29:Mic Simulator
		5:2ch RSS				30:3Band Isolator
		6:Delay RSS				31:Tape Echo 201
		7:Chorus RSS				32:Analog Flanger
		8:Guitar Multi 1				33:Analog Phaser
		9:Guitar Multi 2				(34:FFT *1,*2)
		10:Guitar Multi 3				35:Speaker Modeling
		11:Vocal Multi				(36:Metering Tool Kit *1,*2)
		12:Rotary				(37:31Band Graphic Equalizer *1,*2)
		13:Guitar Amp Simulator				38:Stereo 2Band Dynamics
		14:Stereo Phaser				39:Dual Mono Dynamics
		15:Stereo Flanger				
		16:Dual Comp/Limiter				00 03 02   20 - 7E   Effector - 4 Name -1 (ASCII)
		17:Gate Reverb				00 03 0D   20 - 7E   Effector - 4 Name -12
		18:Multi Tap Delay				00 03 0E   20 - 7E   Effector - 4 Parameter Area (See Below)
		19:Stereo Multi				00 03 7F   20 - 7E
		20:Reverb 2				00 04 00   0aaaaaaa   Effector - 5 Algorithm
		21:Space Chorus				00 04 01   0bbbbbbb   0:Reverb
		22:Lo-Fi Processor				1:Delay
		23:4Band Parametric Equalizer				2:Stereo Delay Chorus
		24:10Band Graphic Equalizer				3:Stereo Pitch Shifter Delay
		25:Hum Canceler				4:Vocoder
		26:Vocal Canceler				5:2ch RSS
		(27:Voice Transformer *1,*2)				6:Delay RSS
		(28:Vocoder 2 *1,*2)				7:Chorus RSS
		29:Mic Simulator				8:Guitar Multi 1
		30:3Band Isolator				9:Guitar Multi 2
		31:Tape Echo 201				10:Guitar Multi 3
		32:Analog Flanger				11:Vocal Multi
		33:Analog Phaser				12:Rotary
		(34:FFT *1,*2)				13:Guitar Amp Simulator
		35:Speaker Modeling				14:Stereo Phaser
		(36:Metering Tool Kit *1,*2)				15:Stereo Flanger
		(37:31Band Graphic Equalizer *1,*2)				16:Dual Comp/Limiter
		38:Stereo 2Band Dynamics				17:Gate Reverb
		39:Dual Mono Dynamics				18:Multi Tap Delay
00 02 02	20 - 7E	Effector - 3 Name -1 (ASCII)				19:Stereo Multi
00 02 0B	20 - 7E	Effector - 3 Name -12				20:Reverb 2
00 02 0E	20 - 7E	Effector - 3 Parameter Area (See Below)				21:Space Chorus
00 02 7F	20 - 7E					22:Lo-Fi Processor
00 03 00	0aaaaaaa	Effector - 4 Algorithm	aaaaaaabbbbbbb =			23:4Band Parametric Equalizer
00 03 01	0bbbbbbb	0:Reverb				24:10Band Graphic Equalizer
		1:Delay				25:Hum Canceler
		2:Stereo Delay Chorus				26:Vocal Canceler
		3:Stereo Pitch Shifter Delay				(27:Voice Transformer *1,*2)
		4:Vocoder				(28:Vocoder 2 *1,*2)
		5:2ch RSS				29:Mic Simulator
		6:Delay RSS				30:3Band Isolator
		7:Chorus RSS				31:Tape Echo 201
		8:Guitar Multi 1				32:Analog Flanger
		9:Guitar Multi 2				33:Analog Phaser
		10:Guitar Multi 3				(34:FFT *1,*2)
		11:Vocal Multi				35:Speaker Modeling
		12:Rotary				(36:Metering Tool Kit *1,*2)
		13:Guitar Amp Simulator				(37:31Band Graphic Equalizer *1,*2)
		14:Stereo Phaser				38:Stereo 2Band Dynamics
		15:Stereo Flanger				39:Dual Mono Dynamics
		16:Dual Comp/Limiter				
		17:Gate Reverb				00 04 02   20 - 7E   Effector - 5 Name -1 (ASCII)
		18:Multi Tap Delay				00 04 0D   20 - 7E   Effector - 5 Name -12
		19:Stereo Multi				00 04 0E   20 - 7E   Effector - 5 Parameter Area (See Below)
		20:Reverb 2				00 04 7F   20 - 7E
00 05 00	0aaaaaaa	Effector - 6 Algorithm	aaaaaaabbbbbbb =			00 05 00   0aaaaaaa   Effector - 6 Algorithm

00 05 01#	0bbbbbb	0:Reverb				29: Mic Simulator	
		1: Delay				30: 3Band Isolator	
		2: Stereo Delay Chorus				31: Tape Echo 201	
		3: Stereo Pitch Shifter Delay				32: Analog Flanger	
		4: Vocoder				33: Analog Phaser	
		5: 2ch RSS				34: FFT	*1,*2
		6: Delay RSS				35: Speaker Modeling	
		7: Chorus RSS				36: Metering Tool Kit	*1,*2
		8: Guitar Multi 1				37: 31Band Graphic Equalizer	*1,*2
		9: Guitar Multi 2				38: Stereo 2Band Dynamics	
		10: Guitar Multi 3				39: Dual Mono Dynamics	
		11: Vocal Multi					
		12: Rotary			00 06 02	20 - 7E	Effector - 7 Name -1 (ASCII)
		13: Guitar Amp Simulator			:	:	:
		14: Stereo Phaser			00 06 0E	20 - 7E	Effector - 7 Name -12
		15: Stereo Flanger			:	:	:
		16: Dual Comp/Limiter			00 05 0E	20 - 7E	Effector - 7 Parameter Area (See Below)
		17: Gate Reverb			:	:	:
		18: Multi Tap Delay			00 05 7F	20 - 7E	:
		19: Stereo Multi			:	:	:
		20: Reverb 2			00 07 00	0aaaaaa	Effector - 8 Algorithm aaaaaabbbbbbb =
		21: Space Chorus			00 07 01#	0bbbbbb	0: Reverb
		22: Lo-Fi Processor					1: Delay
		23: 4Band Parametric Equalizer					2: Stereo Delay Chorus
		24: 10Band Graphic Equalizer					3: Stereo Pitch Shifter Delay
		25: Hum Canceler					4: Vocoder
		26: Vocal Canceler					5: 2ch RSS
		27: Voice Transformer *1,*2					6: Delay RSS
		28: Vocoder 2 *1,*2					7: Chorus RSS
		29: Mic Simulator					8: Guitar Multi 1
		30: 3Band Isolator					9: Guitar Multi 2
		31: Tape Echo 201					10: Guitar Multi 3
		32: Analog Flanger					11: Vocal Multi
		33: Analog Phaser					12: Rotary
		34: FFT *1,*2					13: Guitar Amp Simulator
		35: Speaker Modeling					14: Stereo Phaser
		36: Metering Tool Kit *1,*2					15: Stereo Flanger
		37: 31Band Graphic Equalizer *1,*2					16: Dual Comp/Limiter
		38: Stereo 2Band Dynamics					17: Gate Reverb
		39: Dual Mono Dynamics					18: Multi Tap Delay
							19: Stereo Multi
00 05 02	20 - 7E	Effector - 6 Name -1					20: Reverb 2
:	:	:					21: Space Chorus
00 05 0D	20 - 7E	Effector - 6 Name -12					22: Lo-Fi Processor
:	:	:					23: 4Band Parametric Equalizer
00 05 0E	20 - 7E	Effector - 6 Parameter Area (See Below)					24: 10Band Graphic Equalizer
:	:	:					25: Hum Canceler
00 05 7F	20 - 7E	:					26: Vocal Canceler
:	:	:					27: Voice Transformer *1,*2
00 06 00	0aaaaaa	Effector - 7 Algorithm aaaaaabbbbbbb =					28: Vocoder 2 *1,*2
00 06 01#	0bbbbbb	0: Reverb					29: Mic Simulator
		1: Delay					30: 3Band Isolator
		2: Stereo Delay Chorus					31: Tape Echo 201
		3: Stereo Pitch Shifter Delay					32: Analog Flanger
		4: Vocoder					33: Analog Phaser
		5: 2ch RSS					34: FFT *1,*2
		6: Delay RSS					35: Speaker Modeling
		7: Chorus RSS					36: Metering Tool Kit *1,*2
		8: Guitar Multi 1					37: 31Band Graphic Equalizer *1,*2
		9: Guitar Multi 2					38: Stereo 2Band Dynamics
		10: Guitar Multi 3					39: Dual Mono Dynamics
		11: Vocal Multi					
		12: Rotary			00 07 02	20 - 7E	Effector - 8 Name -1 (ASCII)
		13: Guitar Amp Simulator			:	:	:
		14: Stereo Phaser			00 07 0D	20 - 7E	Effector - 8 Name -12
		15: Stereo Flanger			:	:	:
		16: Dual Comp/Limiter			00 07 0E	20 - 7E	Effector - 8 Parameter Area (See Below)
		17: Gate Reverb			:	:	:
		18: Multi Tap Delay			00 07 7F	20 - 7E	:
		19: Stereo Multi			:	:	:
		20: Reverb 2			00 08 00	0aaaaaa	Master Effector Algorithm aaaaaabbbbbbb =
		21: Space Chorus			00 08 01#	0bbbbbb	0: Speaker Modeling
		22: Lo-Fi Processor					1: 10Band Parametric Equalizer
		23: 4Band Parametric Equalizer					2: 3Band Dynamics
		24: 10Band Graphic Equalizer					
		25: Hum Canceler			00 08 02	20 - 7E	Master Effector Name -1 (ASCII)
		26: Vocal Canceler			:	:	:
		27: Voice Transformer *1,*2			00 08 0D	20 - 7E	Master Effector Name -12
		28: Vocoder 2 *1,*2			:	:	:

# MIDI Implementation

00 08 0E	20 - 7E	Master Effector Parameter Area (See Below)
00 08 7F	20 - 7E	

- (\*1) cannot select "27:Voice Transformer," "28:Vocoder2," "34:FFT," "36:Mstering Tool Kit" or "37:31Band Graphic Equalizer" on FX2, 4, 6 or 8.
- (\*2) cannot use FX2, 4, 6 or 8 if "27:Voice Transformer," "28:Vocoder2," "34:FFT," "36:Mstering Tool Kit" or "37:31Band Graphic Equalizer" is selected on FX1, 3, 5 or 7.
- (\*3) A meaning of the parameter area varies with the top of parameter of Effect Algorithm. See the following tables.
- (\*4) If select the different Algorithm type from current one, all parameters will be copied from the preset patch data which uses the same algorithm.

## Algorithm 0 Reverb

00 00 0E	0aaaaaa	EQ SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	EQ: Low EQ Type	
00 00 11#	0bbbbbb		0,1 = Shelving, Peaking
00 00 12	0aaaaaa	EQ: Low EQ Gain	
00 00 13#	0bbbbbb		-12...12dB
00 00 14	0aaaaaa	EQ: Low EQ Frequency	
00 00 15#	0bbbbbb		2...200 = 20...2000Hz
00 00 16	0aaaaaa	EQ: Low EQ Q	
00 00 17#	0bbbbbb		3...100 = 0.3...10.0
00 00 18	0aaaaaa	EQ: Mid EQ Gain	
00 00 19#	0bbbbbb		-12...12dB
00 00 1A	0aaaaaa	EQ: Mid EQ Frequency	
00 00 1B#	0bbbbbb		20...800 = 200...8000Hz
00 00 1C	0aaaaaa	EQ: Mid EQ Q	
00 00 1D#	0bbbbbb		3...100 = 0.3...10.0
00 00 1E	0aaaaaa	EQ: High EQ Type	
00 00 1F#	0bbbbbb		0,1 = Shelving, Peaking
00 00 20	0aaaaaa	EQ: High EQ Gain	
00 00 21#	0bbbbbb		-12...12dB
00 00 22	0aaaaaa	EQ: High EQ Frequency	
00 00 23#	0bbbbbb		14...200 = 1.4...20.0kHz
00 00 24	0aaaaaa	EQ: High EQ Q	
00 00 25#	0bbbbbb		3...100 = 0.3...10.0
00 00 26	0aaaaaa	EQ: Cut Level	
00 00 27#	0bbbbbb		0...100
00 00 28	0aaaaaa	Reverb: Room Size	
00 00 29#	0bbbbbb		5...40m
00 00 2A	0aaaaaa	Reverb: Reverb Time	
00 00 2B#	0bbbbbb		1...320 = 0.1...32.0s
00 00 2C	0aaaaaa	Reverb: Pre Delay	
00 00 2D#	0bbbbbb		0...200 = 0...200ms
00 00 2E	0aaaaaa	Reverb: Diffusion	
00 00 2F#	0bbbbbb		0...100
00 00 30	0aaaaaa	Reverb: Density	
00 00 31#	0bbbbbb		0...100
00 00 32	0aaaaaa	Reverb: Early Reflection Level	
00 00 33#	0bbbbbb		0...100
00 00 34	0aaaaaa	Reverb: LF Damp Frequency	
00 00 35#	0bbbbbb		5...400 = 50...4000Hz
00 00 36	0aaaaaa	Reverb: LF Damp Gain	
00 00 37#	0bbbbbb		-36...0dB

00 00 38	0aaaaaa	Reverb: HF Damp Frequency	
00 00 39#	0bbbbbb		10...200 = 1.0...20.0kHz
00 00 3A	0aaaaaa	Reverb: HF Damp Gain	
00 00 3B#	0bbbbbb		-36...0dB
00 00 3C	0aaaaaa	Reverb: HI Cut Frequency	
00 00 3D#	0bbbbbb		2...200 = 0.2...20.0kHz
00 00 3E	0aaaaaa	Reverb: Effect Level	
00 00 3F#	0bbbbbb		-100...100
00 00 40	0aaaaaa	Reverb: Direct Level	
00 00 41#	0bbbbbb		-100...100
00 00 42	00	(Reserved)	
00 00 7F	00		

## Algorithm 1 Delay

00 00 0E	0aaaaaa	Delay SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	EQ SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Delay: Delay Time	
00 00 13#	0bbbbbb		0...1200ms
00 00 14	0aaaaaa	Delay: Shift	
00 00 15#	0bbbbbb		-1200...1200 = L1200...R1200ms
00 00 16	0aaaaaa	Delay: Lch Feedback Level	
00 00 17#	0bbbbbb		-100...100
00 00 18	0aaaaaa	Delay: Rch Feedback Level	
00 00 19#	0bbbbbb		-100...100
00 00 1A	0aaaaaa	Delay: Lch Level	
00 00 1B#	0bbbbbb		-100...100
00 00 1C	0aaaaaa	Delay: Rch Level	
00 00 1D#	0bbbbbb		-100...100
00 00 1E	0aaaaaa	Delay: LF Damp Frequency	
00 00 1F#	0bbbbbb		5...400 = 50...4000Hz
00 00 20	0aaaaaa	Delay: LF Damp Gain	
00 00 21#	0bbbbbb		-36...0dB
00 00 22	0aaaaaa	Delay: HF Damp Frequency	
00 00 23#	0bbbbbb		10...200 = 1.0...20.0kHz
00 00 24	0aaaaaa	Delay: HF Damp Gain	
00 00 25#	0bbbbbb		36...0dB
00 00 26	0aaaaaa	Delay: Direct Level	
00 00 27#	0bbbbbb		-100...100
00 00 28	0aaaaaa	EQ: Low EQ Type	
00 00 29#	0bbbbbb		0,1 = Shelving, Peaking
00 00 2A	0aaaaaa	EQ: Low EQ Gain	
00 00 2B#	0bbbbbb		-12...12dB
00 00 2C	0aaaaaa	EQ: Low EQ Frequency	
00 00 2D#	0bbbbbb		2...200 = 20...2000Hz
00 00 2E	0aaaaaa	EQ: Low EQ Q	
00 00 2F#	0bbbbbb		3...100 = 0.3...10.0
00 00 30	0aaaaaa	EQ: Mid EQ Gain	
00 00 31#	0bbbbbb		-12...12dB
00 00 32	0aaaaaa	EQ: Mid EQ Frequency	



00 00 33#	0bbbbbb		20...800 = 200...8000Hz
00 00 34	0aaaaaaa	EQ: Mid EQ Q	
00 00 35#	0bbbbbb		3...100 = 0.3...10.0
00 00 36	0aaaaaaa	EQ: High EQ Type	
00 00 37#	0bbbbbb		0.1 = Shelving, Peaking
00 00 38	0aaaaaaa	EQ: High EQ Gain	
00 00 39#	0bbbbbb		-12...12dB
00 00 3A	0aaaaaaa	EQ: High EQ Frequency	
00 00 3E#	0bbbbbb		14...200 = 1.4...20.0kHz
00 00 3C	0aaaaaaa	EQ: High EQ Q	
00 00 3D#	0bbbbbb		3...100 = 0.3...10.0
00 00 3E	0aaaaaaa	EQ: Out Level	
00 00 3F#	0bbbbbb		0...100
00 00 40	00	(Reserved)	
:	:	:	:
00 00 7F	00		

00 00 2F#	0bbbbbb		-100...100
00 00 30	0aaaaaaa	Chorus: Rch Feedback Level	
00 00 31#	0bbbbbb		-100...100
00 00 32	0aaaaaaa	Chorus: Lch Cross Feedback Level	
00 00 33#	0bbbbbb		-100...100
00 00 34	0aaaaaaa	Chorus: Rch Cross Feedback Level	
00 00 35#	0bbbbbb		-100...100
00 00 36	0aaaaaaa	EQ: Low EQ Type	
00 00 37#	0bbbbbb		0.1 = Shelving, Peaking
00 00 38	0aaaaaaa	EQ: Low EQ Gain	
00 00 39#	0bbbbbb		-12...12dB
00 00 3A	0aaaaaaa	EQ: Low EQ Frequency	
00 00 3B#	0bbbbbb		2...200 = 20...2000Hz
00 00 3C	0aaaaaaa	EQ: Low EQ Q	
00 00 3D#	0bbbbbb		3...100 = 0.3...10.0
00 00 3E	0aaaaaaa	EQ: Mid EQ Gain	
00 00 3F#	0bbbbbb		-12...12dB

\* (Delay Time) + (Absolute Shift) should be 1200 or less.

Algorithm 2 Stereo Delay Chorus

00 00 0E	0aaaaaaa	Delay SW	
00 00 0F#	0bbbbbb		0.1 = Off, On
00 00 10	0aaaaaaa	Chorus SW	
00 00 11#	0bbbbbb		0.1 = Off, On
00 00 12	0aaaaaaa	EQ SW	
00 00 13#	0bbbbbb		0.1 = Off, On
00 00 14	0aaaaaaa	Delay: Delay Time	
00 00 15#	0bbbbbb		0...500ms
00 00 16	0aaaaaaa	Delay: Shift	
00 00 17#	0bbbbbb		-500...500 = 1500...1500ms
00 00 18	0aaaaaaa	Delay: Lch Feedback Level	
00 00 19#	0bbbbbb		-100...100
00 00 1A	0aaaaaaa	Delay: Rch Feedback Level	
00 00 1B#	0bbbbbb		-100...100
00 00 1C	0aaaaaaa	Delay: Lch Cross Feedback Level	
00 00 1D#	0bbbbbb		-100...100
00 00 1E	0aaaaaaa	Delay: Rch Cross Feedback Level	
00 00 1F#	0bbbbbb		-100...100
00 00 20	0aaaaaaa	Delay: Effect Level	
00 00 21#	0bbbbbb		-100...100
00 00 22	0aaaaaaa	Delay: Direct Level	
00 00 23#	0bbbbbb		-100...100
00 00 24	0aaaaaaa	Chorus: Rate	
00 00 25#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 26	0aaaaaaa	Chorus: Depth	
00 00 27#	0bbbbbb		0...100
00 00 28	0aaaaaaa	Chorus: Pre Delay	
00 00 29#	0bbbbbb		0...50ms
00 00 2A	0aaaaaaa	Chorus: Effect Level	
00 00 2B#	0bbbbbb		-100...100
00 00 2C	0aaaaaaa	Chorus: Direct Level	
00 00 2D#	0bbbbbb		-100...100
00 00 2E	0aaaaaaa	Chorus: Lch Feedback Level	

00 00 2F#	0bbbbbb		20...800 = 200...8000Hz
00 00 42	0aaaaaaa	EQ: Mid EQ Q	
00 00 43#	0bbbbbb		3...100 = 0.3...10.0
00 00 44	0aaaaaaa	EQ: High EQ Type	
00 00 45#	0bbbbbb		0.1 = Shelving, Peaking
00 00 46	0aaaaaaa	EQ: High EQ Gain	
00 00 47#	0bbbbbb		-12...12dB
00 00 48	0aaaaaaa	EQ: High EQ Frequency	
00 00 49#	0bbbbbb		14...200 = 1.4...20.0kHz
00 00 4A	0aaaaaaa	EQ: High EQ Q	
00 00 4B#	0bbbbbb		3...100 = 0.3...10.0
00 00 4C	0aaaaaaa	EQ: Out Level	
00 00 4D#	0bbbbbb		0...100
00 00 4E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

\* (Delay Time) + (Absolute Shift) should be 500 or less.

Algorithm 3 Stereo Pitch Shifter Delay

00 00 0E	0aaaaaaa	P.ShifterDelay SW	
00 00 0F#	0bbbbbb		0.1 = Off, On
00 00 10	0aaaaaaa	EQ SW	
00 00 11#	0bbbbbb		0.1 = Off, On
00 00 12	0aaaaaaa	P.ShifterDelay: Lch Chromatic Pitch	
00 00 13#	0bbbbbb		-12...12
00 00 14	0aaaaaaa	P.ShifterDelay: Lch Fine Pitch	
00 00 15#	0bbbbbb		-100...100
00 00 16	0aaaaaaa	P.ShifterDelay: Lch Pre Delay	
00 00 17#	0bbbbbb		0...50ms
00 00 18	0aaaaaaa	P.ShifterDelay: Lch Feedback Delay Time	
00 00 19#	0bbbbbb		0...500ms
00 00 1A	0aaaaaaa	P.ShifterDelay: Lch Feedback Level	
00 00 1B#	0bbbbbb		-100...100
00 00 1C	0aaaaaaa	P.ShifterDelay: Lch Cross Feedback Level	

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00 00 1D#	0bbbbbb	-100,,100
00 00 1E	0aaaaaa	P.ShifterDelay: Rch Chromatic Pitch
00 00 1F#	0bbbbbb	-12,,12
00 00 20	0aaaaaa	P.ShifterDelay: Rch Fine Pitch
00 00 21#	0bbbbbb	-100,,100
00 00 22	0aaaaaa	P.ShifterDelay: Rch Pre Delay
00 00 23#	0bbbbbb	0,,.50ms
00 00 24	0aaaaaa	P.ShifterDelay: Rch Feedback Delay Time
00 00 25#	0bbbbbb	0,,.500ms
00 00 26	0aaaaaa	P.ShifterDelay: Rch Feedback Level
00 00 27#	0bbbbbb	-100,,100
00 00 28	0aaaaaa	P.ShifterDelay: Rch Cross Feedback Level
00 00 29#	0bbbbbb	-100,,100
00 00 2A	0aaaaaa	P.ShifterDelay: Effect Level
00 00 2B#	0bbbbbb	-100,,100
00 00 2C	0aaaaaa	P.ShifterDelay: Direct Level
00 00 2D#	0bbbbbb	-100,,100
00 00 2E	0aaaaaa	EQ: Low EQ Type
00 00 2F#	0bbbbbb	0.1 = Shelving, Peaking
00 00 30	0aaaaaa	EQ: Low EQ Gain
00 00 31#	0bbbbbb	-12,,.12dB
00 00 32	0aaaaaa	EQ: Low EQ Frequency
00 00 33#	0bbbbbb	2,,.200 = 20,,.2000Hz
00 00 34	0aaaaaa	EQ: Low EQ Q
00 00 35#	0bbbbbb	3,,.100 = 0.3,,.10.0
00 00 36	0aaaaaa	EQ: Mid EQ Gain
00 00 37#	0bbbbbb	-12,,.12dB
00 00 38	0aaaaaa	EQ: Mid EQ Frequency
00 00 39#	0bbbbbb	20,,.800 = 200,,.8000Hz
00 00 3A	0aaaaaa	EQ: Mid EQ Q
00 00 3B#	0bbbbbb	3,,.100 = 0.3,,.10.0
00 00 3C	0aaaaaa	EQ: High EQ Type
00 00 3D#	0bbbbbb	0.1 = Shelving, Peaking
00 00 3E	0aaaaaa	EQ: High EQ Gain
00 00 3F#	0bbbbbb	-12,,.12dB
00 00 40	0aaaaaa	EQ: High EQ Frequency
00 00 41#	0bbbbbb	14,,.200 = 1.4,,.20.0kHz
00 00 42	0aaaaaa	EQ: High EQ Q
00 00 43#	0bbbbbb	3,,.100 = 0.3,,.10.0
00 00 44	0aaaaaa	EQ: Out Level
00 00 45#	0bbbbbb	0,,.100
00 00 46	00	(Reserved)
:	:	:
00 00 7F	00	:

## Algorithm 4 Vocoder

00 00 0E	0aaaaaa	Chorus SW
00 00 0F#	0bbbbbb	0.1 = Off, On
00 00 10	0aaaaaa	Vocoder: Voice Character 1
00 00 11#	0bbbbbb	0,,.100
00 00 12	0aaaaaa	Vocoder: Voice Character 2
00 00 13#	0bbbbbb	0,,.100

00 00 14	0aaaaaa	Vocoder: Voice Character 3
00 00 15#	0bbbbbb	0,,.100
00 00 16	0aaaaaa	Vocoder: Voice Character 4
00 00 17#	0bbbbbb	0,,.100
00 00 18	0aaaaaa	Vocoder: Voice Character 5
00 00 19#	0bbbbbb	0,,.100
00 00 1A	0aaaaaa	Vocoder: Voice Character 6
00 00 1B#	0bbbbbb	0,,.100
00 00 1C	0aaaaaa	Vocoder: Voice Character 7
00 00 1D#	0bbbbbb	0,,.100
00 00 1E	0aaaaaa	Vocoder: Voice Character 8
00 00 1F#	0bbbbbb	0,,.100
00 00 20	0aaaaaa	Vocoder: Voice Character 9
00 00 21#	0bbbbbb	0,,.100
00 00 22	0aaaaaa	Vocoder: Voice Character 10
00 00 23#	0bbbbbb	0,,.100
00 00 24	0aaaaaa	Chorus: Rate
00 00 25#	0bbbbbb	1,,.100 = 0.1,,.10.0Hz
00 00 26	0aaaaaa	Chorus: Depth
00 00 27#	0bbbbbb	0,,.100
00 00 28	0aaaaaa	Chorus: Pre Delay
00 00 29#	0bbbbbb	0,,.50ms
00 00 2A	0aaaaaa	Chorus: Feedback Level
00 00 2B#	0bbbbbb	-100,,.100
00 00 2C	0aaaaaa	Chorus: Effect Level
00 00 2D#	0bbbbbb	-100,,.100
00 00 2E	0aaaaaa	Chorus: Direct Level
00 00 2F#	0bbbbbb	-100,,.100
00 00 30	00	(Reserved)
:	:	:
00 00 7F	00	:

## Algorithm 5 2CH RSS

00 00 0E	0aaaaaa	2CH RSS: Ach Azimuth
00 00 0F#	0bbbbbb	-30,,.30 = -180,,.180
00 00 10	0aaaaaa	2CH RSS: Ach Elevation
00 00 11#	0bbbbbb	-15,,.15 = -90,,.90
00 00 12	0aaaaaa	2CH RSS: Bch Azimuth
00 00 13#	0bbbbbb	-30,,.30 = -180,,.180
00 00 14	0aaaaaa	2CH RSS: Bch Elevation
00 00 15#	0bbbbbb	-15,,.15 = -90,,.90
00 00 16	00	(Reserved)
:	:	:
00 00 7F	00	:

## Algorithm 6 Delay RSS

00 00 0E	0aaaaaa	Delay RSS: Delay Time
00 00 0F#	0bbbbbb	0,,.1200ms
00 00 10	0aaaaaa	Delay RSS: Shift
00 00 11#	0bbbbbb	-1200,,.1200 = L1200,,.R1200ms
00 00 12	0aaaaaa	Delay RSS: Center Delay Time
00 00 13#	0bbbbbb	0,,.1200ms
00 00 14	0aaaaaa	Delay RSS: RSS Level

00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaa	Delay RSS: Center Level	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaa	Delay RSS: Feedback Level	
00 00 19#	0bbbbbb		-100...100
00 00 1A	0aaaaaa	Delay RSS: LF Damp Frequency	
00 00 1B#	0bbbbbb		5...400 = 50...4000Hz
00 00 1C	0aaaaaa	Delay RSS: LF Damp Gain	
00 00 1D#	0bbbbbb		-36...0dB
00 00 1E	0aaaaaa	Delay RSS: HF Damp Frequency	
00 00 1F#	0bbbbbb		10...200 = 1.0...20.0kHz
00 00 20	0aaaaaa	Delay RSS: HF Damp Gain	
00 00 21#	0bbbbbb		-36...0dB
00 00 22	0aaaaaa	Delay RSS: Effect Level	
00 00 23#	0bbbbbb		-100...100
00 00 24	0aaaaaa	Delay RSS: Direct Level	
00 00 25#	0bbbbbb		-100...100
00 00 26	00	(Reserved)	
:	:		
00 00 7F	00		

Algorithm 7 Chorus RSS

00 00 0E	0aaaaaa	Chorus RSS: Chorus Rate	
00 00 0F#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 10	0aaaaaa	Chorus RSS: Chorus Depth	
00 00 11#	0bbbbbb		0...100
00 00 12	0aaaaaa	Chorus RSS: Effect Level	
00 00 13#	0bbbbbb		-100...100
00 00 14	0aaaaaa	Chorus RSS: Direct Level	
00 00 15#	0bbbbbb		-100...100
00 00 16	00	(Reserved)	
:	:		
00 00 7F	00		

Common for Algorithm 8, 9, 10 Guitar Multi 1, 2, 3

00 00 0E	0aaaaaa	Compressor SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	Metal Distortion/Over Drive SW	
00 00 11#	0bbbbbb		0.1 = Off,On
00 00 12	0aaaaaa	Noise Suppressor SW	
00 00 13#	0bbbbbb		0.1 = Off,On
00 00 14	0aaaaaa	Auto Wah SW	
00 00 15#	0bbbbbb		0.1 = Off,On
00 00 16	0aaaaaa	Guitar Amp Simulator SW	
00 00 17#	0bbbbbb		0.1 = Off,On
00 00 18	0aaaaaa	Flanger SW	
00 00 19#	0bbbbbb		0.1 = Off,On
00 00 1A	0aaaaaa	Delay SW	
00 00 1B#	0bbbbbb		0.1 = Off,On
00 00 1C	0aaaaaa	Compressor: Attack	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	Compressor: Level	
00 00 1F#	0bbbbbb		0...100

00 00 20	0aaaaaa	Compressor: Sustain	
00 00 21#	0bbbbbb		0...100
00 00 22	0aaaaaa	Compressor: Tone	
00 00 23#	0bbbbbb		-50...-50
00 00 24	0aaaaaa	Noise Suppressor: Threshold	
00 00 25#	0bbbbbb		0...100
00 00 26	0aaaaaa	Noise Suppressor: Release	
00 00 27#	0bbbbbb		0...100
00 00 28	0aaaaaa	Auto Wah: Mode	
00 00 29#	0bbbbbb		0.1 = LPF,BPF
00 00 2A	0aaaaaa	Auto Wah: Polarity	
00 00 2B#	0bbbbbb		0.1 = Down,Up
00 00 2C	0aaaaaa	Auto Wah: Frequency	
00 00 2D#	0bbbbbb		0...100
00 00 2E	0aaaaaa	Auto Wah: Level	
00 00 2F#	0bbbbbb		0...100
00 00 30	0aaaaaa	Auto Wah: Peak	
00 00 31#	0bbbbbb		0...100
00 00 32	0aaaaaa	Auto Wah: Sens	
00 00 33#	0bbbbbb		0...100
00 00 34	0aaaaaa	Auto Wah: Rate	
00 00 35#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 36	0aaaaaa	Auto Wah: Depth	
00 00 37#	0bbbbbb		0...100
00 00 38	0aaaaaa	Guitar Amp Simulator: Mode	
00 00 39#	0bbbbbb		0...3 = Small,BultIn,2Stack,3Stack
00 00 3A	0aaaaaa	Flanger: Rate	
00 00 3B#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 3C	0aaaaaa	Flanger: Depth	
00 00 3D#	0bbbbbb		0...100
00 00 3E	0aaaaaa	Flanger: Manual	
00 00 3F#	0bbbbbb		0...100
00 00 40	0aaaaaa	Flanger: Resonance	
00 00 41#	0bbbbbb		0...100
00 00 42	0aaaaaa	Delay: Delay Time	
00 00 43#	0bbbbbb		0...1000ms
00 00 44	0aaaaaa	Delay: Shift	
00 00 45#	0bbbbbb		-1000...1000 = L1000...R1000ms
00 00 46	0aaaaaa	Delay: Feedback Time	
00 00 47#	0bbbbbb		0...1000ms
00 00 48	0aaaaaa	Delay: Feedback Level	
00 00 49#	0bbbbbb		-100...100
00 00 4A	0aaaaaa	Delay: Effect Level	
00 00 4B#	0bbbbbb		-100...100
00 00 4C	0aaaaaa	Delay: Direct Level	
00 00 4D#	0bbbbbb		-100...100

\* (Delay Time) + (Absolute Shift) should be 1000 or less.

Individual : Algorithm 8 Guitar Multi 1

00 00 4E	0aaaaaa	Metal: Gain	
00 00 4F#	0bbbbbb		0...100

MIDI Implementation

# MIDI Implementation

00 00 50		Gaaaaaaa		Metal: Level	
00 00 51#		0bbbbbbb			0,,100
00 00 52		Gaaaaaaa		Metal: Hi Gain	
00 00 53#		0bbbbbbb			-100,,100
00 00 54		Gaaaaaaa		Metal: Mid Gain	
00 00 55#		0bbbbbbb			-100,,100
00 00 56		Gaaaaaaa		Metal: Low Gain	
00 00 57#		0bbbbbbb			-100,,100
00 00 58		00		(Reserved)	
:		:		:	
00 00 7F		00			

## Individual : Algorithm 9 Guitar Multi 2

00 00 4E		Gaaaaaaa		Distortion: Gain	
00 00 4F#		0bbbbbbb			0,,100
00 00 50		Gaaaaaaa		Distortion: Level	
00 00 51#		0bbbbbbb			0,,100
00 00 52		Gaaaaaaa		Distortion: Tone	
00 00 53#		0bbbbbbb			0,,100
00 00 54		00		(Reserved)	
:		:		:	
00 00 7F		00			

## Individual : Algorithm 10 Guitar Multi 3

00 00 4E		Gaaaaaaa		Over Drive: Gain	
00 00 4F#		0bbbbbbb			0,,100
00 00 50		Gaaaaaaa		Over Drive: Level	
00 00 51#		0bbbbbbb			0,,100
00 00 52		Gaaaaaaa		Over Drive: Tone	
00 00 53#		0bbbbbbb			0,,100
00 00 54		00		(Reserved)	
:		:		:	
00 00 7F		00			

## Algorithm 11 Vocal Multi

00 00 0E		Gaaaaaaa		Noise Suppressor SW	
00 00 0F#		0bbbbbbb			0.1 = Off,On
00 00 10		Gaaaaaaa		Limitier/De-esser SW	
00 00 11#		0bbbbbbb			0.1 = Off,On
00 00 12		Gaaaaaaa		Enhancer SW	
00 00 13#		0bbbbbbb			0.1 = Off,On
00 00 14		Gaaaaaaa		EQ SW	
00 00 15#		0bbbbbbb			0.1 = Off,On
00 00 16		Gaaaaaaa		P.Shifter SW	
00 00 17#		0bbbbbbb			0.1 = Off,On
00 00 18		Gaaaaaaa		Delay SW	
00 00 19#		0bbbbbbb			0.1 = Off,On
00 00 1A		Gaaaaaaa		Chorus SW	
00 00 1B#		0bbbbbbb			0.1 = Off,On
00 00 1C		Gaaaaaaa		Limitier/De-esser Mode	
00 00 1D#		0bbbbbbb			0.1 = Limitier,De-esser
00 00 1E		Gaaaaaaa		Noise Suppressor: Threshold	
00 00 1F#		0bbbbbbb			0,,100

00 00 20		Gaaaaaaa		Noise Suppressor: Release	
00 00 21#		0bbbbbbb			0,,100
00 00 22		Gaaaaaaa		Limitier: Threshold	
00 00 23#		0bbbbbbb			0,,100
00 00 24		Gaaaaaaa		Limitier: Release	
00 00 25#		0bbbbbbb			0,,100
00 00 26		Gaaaaaaa		Limitier: Level	
00 00 27#		0bbbbbbb			0,,100
00 00 28		Gaaaaaaa		De-esser: Sens	
00 00 29#		0bbbbbbb			0,,100
00 00 2A		Gaaaaaaa		De-esser: Frequency	
00 00 2B#		0bbbbbbb			10,,100 = 1.0,,10.0kHz
00 00 2C		Gaaaaaaa		Enhancer: Sens	
00 00 2D#		0bbbbbbb			0,,100
00 00 2E		Gaaaaaaa		Enhancer: Frequency	
00 00 2F#		0bbbbbbb			10,,100 = 1.0,,10.0kHz
00 00 30		Gaaaaaaa		Enhancer: MIX Level	
00 00 31#		0bbbbbbb			0,,100
00 00 32		Gaaaaaaa		Enhancer: Level	
00 00 33#		0bbbbbbb			0,,100
00 00 34		Gaaaaaaa		EQ: Low EQ Type	
00 00 35#		0bbbbbbb			0.1 = Shelving, Peaking
00 00 36		Gaaaaaaa		EQ: Low EQ Gain	
00 00 37#		0bbbbbbb			-12,,12dB
00 00 38		Gaaaaaaa		EQ: Low EQ Frequency	
00 00 39#		0bbbbbbb			2,,200 = 20,,2000Hz
00 00 3A		Gaaaaaaa		EQ: Low EQ Q	
00 00 3B#		0bbbbbbb			3,,100 = 0.3,,10.0
00 00 3C		Gaaaaaaa		EQ: Mid EQ Gain	
00 00 3D#		0bbbbbbb			-12,,12dB
00 00 3E		Gaaaaaaa		EQ: Mid EQ Frequency	
00 00 3F#		0bbbbbbb			20,,800 = 200,,8000Hz
00 00 40		Gaaaaaaa		EQ: Mid EQ Q	
00 00 41#		0bbbbbbb			3,,100 = 0.3,,10.0
00 00 42		Gaaaaaaa		EQ: High EQ Type	
00 00 43#		0bbbbbbb			0.1 = Shelving, Peaking
00 00 44		Gaaaaaaa		EQ: High EQ Gain	
00 00 45#		0bbbbbbb			-12,,12dB
00 00 46		Gaaaaaaa		EQ: High EQ Frequency	
00 00 47#		0bbbbbbb			14,,200 = 1.4,,20.0kHz
00 00 48		Gaaaaaaa		EQ: High EQ Q	
00 00 49#		0bbbbbbb			3,,100 = 0.3,,10.0
00 00 4A		Gaaaaaaa		EQ: Out Level	
00 00 4B#		0bbbbbbb			0,,100
00 00 4C		Gaaaaaaa		P.Shifter: Chromatic Pitch	
00 00 4D#		0bbbbbbb			-12,,12
00 00 4E		Gaaaaaaa		P.Shifter: Fine Pitch	
00 00 4F#		0bbbbbbb			-100,,100
00 00 50		Gaaaaaaa		P.Shifter: Effect Level	
00 00 51#		0bbbbbbb			-100,,100
00 00 52		Gaaaaaaa		P.Shifter: Direct Level	
00 00 53#		0bbbbbbb			-100,,100
00 00 54		Gaaaaaaa		Delay: Delay Time	

00 00 55#	0bbbbbb		0...1000
00 00 56	0aaaaaaa	Delay: Feedback Level	
00 00 57#	0bbbbbb		-100...100
00 00 58	0aaaaaaa	Delay: Effect Level	
00 00 59#	0bbbbbb		-100...100
00 00 5A	0aaaaaaa	Delay: Direct Level	
00 00 5B#	0bbbbbb		-100...100
00 00 5C	0aaaaaaa	Chorus: Rate	
00 00 5D#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 5E	0aaaaaaa	Chorus: Depth	
00 00 5F#	0bbbbbb		0...100
00 00 60	0aaaaaaa	Chorus: Pre Delay	
00 00 61#	0bbbbbb		0...50ms
00 00 62	0aaaaaaa	Chorus: Effect Level	
00 00 63#	0bbbbbb		-100...100
00 00 64	0aaaaaaa	Chorus: Direct Level	
00 00 65#	0bbbbbb		-100...100
00 00 66	00	(Reserved)	
:	:	:	:
00 00 7F	00		

Algorithm 12 Rotary

00 00 0E	0aaaaaaa	Noise Suppressor SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaaa	Over Drive SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaaa	Noise Suppressor: Threshold	
00 00 13#	0bbbbbb		0...100
00 00 14	0aaaaaaa	Noise Suppressor: Release	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaaa	Over Drive: Gain	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaaa	Over Drive: Level	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaaa	Rotary: Low Rate	
00 00 1B#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 1C	0aaaaaaa	Rotary: Hi Rate	
00 00 1D#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 1E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

Algorithm 13 Guitar AMP Simulator

00 00 0E	0aaaaaaa	Noise Suppressor SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaaa	Pre Amp SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaaa	Speaker SW	
00 00 13#	0bbbbbb		0,1 = Off,On
00 00 14	0aaaaaaa	Noise Suppressor: Threshold	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaaa	Noise Suppressor: Release	
00 00 17#	0bbbbbb		0...100

00 00 18	0aaaaaaa	Pre Amp: Mode	
00 00 19#	0bbbbbb		0...13 = JC-120,Clean Twin,Match Drive,BG Lead, MS1959(I), MS1959(II), MS1959(I+II), SLDN Lead, Metal 5150, Metal Lead, CD-1, OD-2Turbo, Distortion, Fuzz
00 00 1A	0aaaaaaa	Pre Amp: Volume	
00 00 1B#	0bbbbbb		0...100
00 00 1C	0aaaaaaa	Pre Amp: Bass	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaaa	Pre Amp: Middle	
00 00 1F#	0bbbbbb		0...100
00 00 20	0aaaaaaa	Pre Amp: Treble	
00 00 21#	0bbbbbb		0...100
00 00 22	0aaaaaaa	Pre Amp: Presence	
00 00 23#	0bbbbbb		0...100
00 00 24	0aaaaaaa	Pre Amp: Master	
00 00 25#	0bbbbbb		0...100
00 00 26	0aaaaaaa	Pre Amp: Bright	
00 00 27#	0bbbbbb		0,1 = Off,On
00 00 28	0aaaaaaa	Pre Amp: Gain	
00 00 29#	0bbbbbb		0,1,2 = Low,Middle,High
00 00 2A	0aaaaaaa	Speaker: Type	
00 00 2B#	0bbbbbb		0...11 = Small, Middle, JC-120, Built In 1, Built In 2,Built In 3, Built In 4, BG Stack 1, BG Stack 2, MS Stack 1, MS Stack 2, Metal Stack
00 00 2C	0aaaaaaa	Speaker: MIC Setting	
00 00 2D#	0bbbbbb		0,1,2 = 1,2,3
00 00 2E	0aaaaaaa	Speaker: MIC Level	
00 00 2F#	0bbbbbb		0...100
00 00 30	0aaaaaaa	Speaker: Direct Level	
00 00 31#	0bbbbbb		0...100
00 00 32	00	(Reserved)	
:	:	:	:
00 00 7F	00		

- (\*) The "Pre Amp Middle" is invalid when "Mode" is "Match Drive."
- (\*) The "Pre Amp Presence" works counter to the Value(-100,0) when "Mode" is "Match Drive."
- (\*) The "Pre Amp Bright" is valid when "Mode" is "JC-120," "Clean Twin" or "BG Lead."

Algorithm 14 Stereo Phaser

00 00 0E	0aaaaaaa	Phaser SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaaa	EQ SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaaa	Phaser: Mode	
00 00 13#	0bbbbbb		0...3 = 4.8.12.16stage
00 00 14	0aaaaaaa	Phaser: Rate	
00 00 15#	0bbbbbb		1...100 = 0.1...10.0Hz
00 00 16	0aaaaaaa	Phaser: Depth	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaaa	Phaser: Polarity	
00 00 19#	0bbbbbb		0,1 = Inverse,Synchro
00 00 1A	0aaaaaaa	Phaser: Manual	
00 00 1B#	0bbbbbb		0...100

# MIDI Implementation

00 00 1C#	0aaaaaa	Phaser: Resonance	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	Phaser: Cross Feedback	
00 00 1F#	0bbbbbb		0...100
00 00 20	0aaaaaa	Phaser: Effect Level	
00 00 21#	0bbbbbb		-100...100
00 00 22	0aaaaaa	Phaser: Direct Level	
00 00 23#	0bbbbbb		-100...100
00 00 24	0aaaaaa	EQ: Low EQ Type	
00 00 25#	0bbbbbb	0,1 = Shelving, Peaking	
00 00 26	0aaaaaa	EQ: Low EQ Gain	
00 00 27#	0bbbbbb		-12...12dB
00 00 28	0aaaaaa	EQ: Low EQ Frequency	
00 00 29#	0bbbbbb	2...200 = 20...2000Hz	
00 00 2A	0aaaaaa	EQ: Low EQ Q	
00 00 2B#	0bbbbbb	3...100 = 0.3...10.0	
00 00 2C	0aaaaaa	EQ: Mid EQ Gain	
00 00 2D#	0bbbbbb		-12...12dB
00 00 2E	0aaaaaa	EQ: Mid EQ Frequency	
00 00 2F#	0bbbbbb	20...800 = 200...8000Hz	
00 00 30	0aaaaaa	EQ: Mid EQ Q	
00 00 31#	0bbbbbb	3...100 = 0.3...10.0	
00 00 32	0aaaaaa	EQ: High EQ Type	
00 00 33#	0bbbbbb	0,1 = Shelving, Peaking	
00 00 34	0aaaaaa	EQ: High EQ Gain	
00 00 35#	0bbbbbb		-12...12dB
00 00 36	0aaaaaa	EQ: High EQ Frequency	
00 00 37#	0bbbbbb	14...200 = 1.4...20.0kHz	
00 00 38	0aaaaaa	EQ: High EQ Q	
00 00 39#	0bbbbbb	3...100 = 0.3...10.0	
00 00 3A	0aaaaaa	EQ: Out Level	
00 00 3B#	0bbbbbb		0...100
00 00 3C	00	(Reserved)	
00 00 7F	00		

## Algorithm 15 Stereo Flanger

00 00 0E	0aaaaaa	Flanger SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	EQ SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Flanger: Rate	
00 00 13#	0bbbbbb	1...100 = 0.1...10.0Hz	
00 00 14	0aaaaaa	Flanger: Depth	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaa	Flanger: Polarity	
00 00 17#	0bbbbbb	0,1 = Inverse, Synchro	
00 00 18	0aaaaaa	Flanger: Manual	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	Flanger: Resonance	
00 00 1B#	0bbbbbb		0...100
00 00 1C	0aaaaaa	Flanger: Cross Feedback Level	

00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	Flanger: Effect Level	
00 00 1F#	0bbbbbb		-100...100
00 00 20	0aaaaaa	Flanger: Direct Level	
00 00 21#	0bbbbbb		-100...100
00 00 22	0aaaaaa	EQ: Low EQ Type	
00 00 23#	0bbbbbb	0,1 = Shelving, Peaking	
00 00 24	0aaaaaa	EQ: Low EQ Gain	
00 00 25#	0bbbbbb		-12...12dB
00 00 26	0aaaaaa	EQ: Low EQ Frequency	
00 00 27#	0bbbbbb	2...200 = 20...2000Hz	
00 00 28	0aaaaaa	EQ: Low EQ Q	
00 00 29#	0bbbbbb	3...100 = 0.3...10.0	
00 00 2A	0aaaaaa	EQ: Mid EQ Gain	
00 00 2B#	0bbbbbb		-12...12dB
00 00 2C	0aaaaaa	EQ: Mid EQ Frequency	
00 00 2D#	0bbbbbb	20...800 = 200...8000Hz	
00 00 2E	0aaaaaa	EQ: Mid EQ Q	
00 00 2F#	0bbbbbb	3...100 = 0.3...10.0	
00 00 30	0aaaaaa	EQ: High EQ Type	
00 00 31#	0bbbbbb	0,1 = Shelving, Peaking	
00 00 32	0aaaaaa	EQ: High EQ Gain	
00 00 33#	0bbbbbb		-12...12dB
00 00 34	0aaaaaa	EQ: High EQ Frequency	
00 00 35#	0bbbbbb	14...200 = 1.4...20.0kHz	
00 00 36	0aaaaaa	EQ: High EQ Q	
00 00 37#	0bbbbbb	3...100 = 0.3...10.0	
00 00 38	0aaaaaa	EQ: Out Level	
00 00 39#	0bbbbbb		0...100
00 00 3A	00	(Reserved)	
00 00 7F	00		

## Algorithm 16 Dual Compressor/Limiter

00 00 0E	0aaaaaa	Comp/Limit A SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	Noise Suppressor A SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Comp/Limit B SW	
00 00 13#	0bbbbbb		0,1 = Off,On
00 00 14	0aaaaaa	Noise Suppressor B SW	
00 00 15#	0bbbbbb		0,1 = Off,On
00 00 16	0aaaaaa	Comp/Limit A: Detect	
00 00 17#	0bbbbbb		0,1,2 = A,E,Link
00 00 18	0aaaaaa	Comp/Limit A: Level	
00 00 19#	0bbbbbb		-60...12dB
00 00 1A	0aaaaaa	Comp/Limit A: Thresh	
00 00 1B#	0bbbbbb		-60...0dB
00 00 1C	0aaaaaa	Comp/Limit A: Attack	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	Comp/Limit A: Release	
00 00 1F#	0bbbbbb		0...100

00 00 20	0aaaaaa	Comp/Limit A: Ratio	
00 00 21#	0bbbbbb		0...3 = 1.5:1.2:1.4:1.100:1
00 00 22	0aaaaaa	Noise Suppressor A: Detect	
00 00 23#	0bbbbbb		0,1,2 = A,B,Link
00 00 24	0aaaaaa	Noise Suppressor A: Threshold	
00 00 25#	0bbbbbb		0...100
00 00 26	0aaaaaa	Noise Suppressor A: Release	
00 00 27#	0bbbbbb		0...100
00 00 28	0aaaaaa	Comp/Limit B: Detect	
00 00 29#	0bbbbbb		0,1,2 = A,B,Link
00 00 2A	0aaaaaa	Comp/Limit B: Level	
00 00 2B#	0bbbbbb		-60...12dB
00 00 2C	0aaaaaa	Comp/Limit B: Thresh	
00 00 2D#	0bbbbbb		-60...0dB
00 00 2E	0aaaaaa	Comp/Limit B: Attack	
00 00 2F#	0bbbbbb		0...100
00 00 30	0aaaaaa	Comp/Limit B: Release	
00 00 31#	0bbbbbb		0...100
00 00 32	0aaaaaa	Comp/Limit B: Ratio	
00 00 33#	0bbbbbb		0...3 = 1.5:1.2:1.4:1.100:1
00 00 34	0aaaaaa	Noise Suppressor B: Detect	
00 00 35#	0bbbbbb		0,1,2 = A,B,Link
00 00 36	0aaaaaa	Noise Suppressor B: Threshold	
00 00 37#	0bbbbbb		0...100
00 00 38	0aaaaaa	Noise Suppressor B: Release	
00 00 39#	0bbbbbb		0...100
00 00 3A	00	(Reserved)	
:	:	:	:
00 00 7F	00		

00 00 24	0aaaaaa	G.Reverb: Direct Level	
00 00 25#	0bbbbbb		-100...100
00 00 26	0aaaaaa	EQ: Low EQ Type	
00 00 27#	0bbbbbb		0.1 = Shelving. Peaking
00 00 28	0aaaaaa	EQ: Low EQ Gain	
00 00 29#	0bbbbbb		-12...12dB
00 00 2A	0aaaaaa	EQ: Low EQ Frequency	
00 00 2B#	0bbbbbb		2...200 = 20...2000Hz
00 00 2C	0aaaaaa	EQ: Low EQ Q	
00 00 2D#	0bbbbbb		3...100 = 0.3...10.0
00 00 2E	0aaaaaa	EQ: Mid EQ Gain	
00 00 2F#	0bbbbbb		-12...12dB
00 00 30	0aaaaaa	EQ: Mid EQ Frequency	
00 00 31#	0bbbbbb		20...800 = 200...8000Hz
00 00 32	0aaaaaa	EQ: Mid EQ Q	
00 00 33#	0bbbbbb		3...100 = 0.3...10.0
00 00 34	0aaaaaa	EQ: High EQ Type	
00 00 35#	0bbbbbb		0.1 = Shelving. Peaking
00 00 36	0aaaaaa	EQ: High EQ Gain	
00 00 37#	0bbbbbb		-12...12dB
00 00 38	0aaaaaa	EQ: High EQ Frequency	
00 00 39#	0bbbbbb		14...200 = 1.4...20.0kHz
00 00 3A	0aaaaaa	EQ: High EQ Q	
00 00 3B#	0bbbbbb		3...100 = 0.3...10.0
00 00 3C	0aaaaaa	EQ: Cut Level	
00 00 3D#	0bbbbbb		0...100
00 00 3E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

Algorithm 17 Gate Reverb

00 00 0E	0aaaaaa	G.Reverb SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	EQ SW	
00 00 11#	0bbbbbb		0.1 = Off,On
00 00 12	0aaaaaa	G.Reverb: Gate Time	
00 00 13#	0bbbbbb		10...400ms
00 00 14	0aaaaaa	G.Reverb: Pre Delay	
00 00 15#	0bbbbbb		0...300ms
00 00 15	0aaaaaa	G.Reverb: Effect Level	
00 00 17#	0bbbbbb		-100...100
00 00 18	0aaaaaa	G.Reverb: Mode	
00 00 19#	0bbbbbb		0...4 = Normal,L->R,R->L,Reverse1,Reverse2
00 00 1A	0aaaaaa	G.Reverb: Thickness	
00 00 1B#	0bbbbbb		0...100
00 00 1C	0aaaaaa	G.Reverb: Density	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	G.Reverb: Accent Delay	
00 00 1F#	0bbbbbb		0...200ms
00 00 20	0aaaaaa	G.Reverb: Accent Level	
00 00 21#	0bbbbbb		0...100
00 00 22	0aaaaaa	G.Reverb: Accent Pan	
00 00 23#	0bbbbbb		1...127 = L63...R63

Algorithm 18 Multi Tap Delay

00 00 0E	0aaaaaa	EQ SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	M.Tap Delay: Time 1	
00 00 11#	0bbbbbb		0...1200ms
00 00 12	0aaaaaa	M.Tap Delay: Level 1	
00 00 12#	0bbbbbb		0...100
00 00 14	0aaaaaa	M.Tap Delay: Pan 1	
00 00 15#	0bbbbbb		1...127 = L63...R63
00 00 16	0aaaaaa	M.Tap Delay: Time 2	
00 00 17#	0bbbbbb		0...1200ms
00 00 18	0aaaaaa	M.Tap Delay: Level 2	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	M.Tap Delay: Pan 2	
00 00 1B#	0bbbbbb		1...127 = L63...R63
00 00 1C	0aaaaaa	M.Tap Delay: Time 3	
00 00 1D#	0bbbbbb		0...1200ms
00 00 1E	0aaaaaa	M.Tap Delay: Level 3	
00 00 1F#	0bbbbbb		0...100
00 00 20	0aaaaaa	M.Tap Delay: Pan 3	
00 00 21#	0bbbbbb		1...127 = L63...R63
00 00 22	0aaaaaa	M.Tap Delay: Time 4	

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00 00 23#	0bbbbbb	0...1200ms
00 00 24	0aaaaaaa  M.Tap Delay: Level 4	
00 00 25#	0bbbbbb	0...100
00 00 26	0aaaaaaa  M.Tap Delay: Pan 4	
00 00 27#	0bbbbbb	1...127 = L63...R63
00 00 28	0aaaaaaa  M.Tap Delay: Time 5	
00 00 29#	0bbbbbb	0...1200ms
00 00 2A	0aaaaaaa  M.Tap Delay: Level 5	
00 00 2B#	0bbbbbb	0...100
00 00 2C	0aaaaaaa  M.Tap Delay: Pan 5	
00 00 2D#	0bbbbbb	1...127 = L63...R63
00 00 2E	0aaaaaaa  M.Tap Delay: Time 6	
00 00 2F#	0bbbbbb	0...1200ms
00 00 30	0aaaaaaa  M.Tap Delay: Level 6	
00 00 31#	0bbbbbb	0...100
00 00 32	0aaaaaaa  M.Tap Delay: Pan 6	
00 00 33#	0bbbbbb	1...127 = L63...R63
00 00 34	0aaaaaaa  M.Tap Delay: Time 7	
00 00 35#	0bbbbbb	0...1200ms
00 00 36	0aaaaaaa  M.Tap Delay: Level 7	
00 00 37#	0bbbbbb	0...100
00 00 38	0aaaaaaa  M.Tap Delay: Pan 7	
00 00 39#	0bbbbbb	1...127 = L63...R63
00 00 3A	0aaaaaaa  M.Tap Delay: Time 8	
00 00 3B#	0bbbbbb	0...1200ms
00 00 3C	0aaaaaaa  M.Tap Delay: Level 8	
00 00 3D#	0bbbbbb	0...100
00 00 3E	0aaaaaaa  M.Tap Delay: Pan 8	
00 00 3F#	0bbbbbb	1...127 = L63...R63
00 00 40	0aaaaaaa  M.Tap Delay: Time 9	
00 00 41#	0bbbbbb	0...1200ms
00 00 42	0aaaaaaa  M.Tap Delay: Level 9	
00 00 43#	0bbbbbb	0...100
00 00 44	0aaaaaaa  M.Tap Delay: Pan 9	
00 00 45#	0bbbbbb	1...127 = L63...R63
00 00 46	0aaaaaaa  M.Tap Delay: Time 10	
00 00 47#	0bbbbbb	0...1200ms
00 00 48	0aaaaaaa  M.Tap Delay: Level 10	
00 00 49#	0bbbbbb	0...100
00 00 4A	0aaaaaaa  M.Tap Delay: Pan 10	
00 00 4B#	0bbbbbb	1...127 = L63...R63
00 00 4C	0aaaaaaa  M.Tap Delay: Feedback Delay Time	
00 00 4D#	0bbbbbb	0...1200ms
00 00 4E	0aaaaaaa  M.Tap Delay: Feedback Level	
00 00 4F#	0bbbbbb	-100...100
00 00 50	0aaaaaaa  M.Tap Delay: Effect Level	
00 00 51#	0bbbbbb	-100...100
00 00 52	0aaaaaaa  M.Tap Delay: Direct Level	
00 00 53#	0bbbbbb	-100...100
00 00 54	0aaaaaaa  EQ: Low EQ Type	
00 00 55#	0bbbbbb	0,1 = Shelving, Peaking
00 00 56	0aaaaaaa  EQ: Low EQ Gain	
00 00 57#	0bbbbbb	-12...12dB

00 00 58	0aaaaaaa  EQ: Low EQ Frequency	
00 00 59#	0bbbbbb	2...200 = 20...2000Hz
00 00 5A	0aaaaaaa  EQ: Low EQ Q	
00 00 5B#	0bbbbbb	3...100 = 0.3...10.0
00 00 5C	0aaaaaaa  EQ: Mid EQ Gain	
00 00 5D#	0bbbbbb	-12...12dB
00 00 5E	0aaaaaaa  EQ: Mid EQ Frequency	
00 00 5F#	0bbbbbb	20...800 = 200...8000Hz
00 00 60	0aaaaaaa  EQ: Mid EQ Q	
00 00 61#	0bbbbbb	3...100 = 0.3...10.0
00 00 62	0aaaaaaa  EQ: High EQ Type	
00 00 63#	0bbbbbb	0,1 = Shelving, Peaking
00 00 64	0aaaaaaa  EQ: High EQ Gain	
00 00 65#	0bbbbbb	-12...12dB
00 00 66	0aaaaaaa  EQ: High EQ Frequency	
00 00 67#	0bbbbbb	14...200 = 1.4...20.0kHz
00 00 68	0aaaaaaa  EQ: High EQ Q	
00 00 69#	0bbbbbb	3...100 = 0.3...10.0
00 00 6A	0aaaaaaa  EQ: Out Level	
00 00 6B#	0bbbbbb	0...100
00 00 6C	00	(Reserved)
:	:	:
00 00 7F	00	

## Algorithm 19 Stereo Multi

00 00 0E	0aaaaaaa  Noise Suppressor SW	
00 00 0F#	0bbbbbb	0,1 = Off,On
00 00 10	0aaaaaaa  Comp/Limit SW	
00 00 11#	0bbbbbb	0,1 = Off,On
00 00 12	0aaaaaaa  Enhancer SW	
00 00 13#	0bbbbbb	0,1 = Off,On
00 00 14	0aaaaaaa  EQ SW	
00 00 15#	0bbbbbb	0,1 = Off,On
00 00 16	0aaaaaaa  Noise Suppressor: Threshold	
00 00 17#	0bbbbbb	0...100
00 00 18	0aaaaaaa  Noise Suppressor: Release	
00 00 19#	0bbbbbb	0...100
00 00 1A	0aaaaaaa  Comp/Limit: Level	
00 00 1B#	0bbbbbb	-60...12dB
00 00 1C	0aaaaaaa  Comp/Limit: Thresh	
00 00 1D#	0bbbbbb	60...0dB
00 00 1E	0aaaaaaa  Comp/Limit: Attack	
00 00 1F#	0bbbbbb	0...100
00 00 20	0aaaaaaa  Comp/Limit: Release	
00 00 21#	0bbbbbb	0...100
00 00 22	0aaaaaaa  Comp/Limit: Ratio	
00 00 23#	0bbbbbb	0...3 = 1.5:1,2:1,4:1,100:1
00 00 24	0aaaaaaa  Enhancer: Sens	
00 00 25#	0bbbbbb	0...100
00 00 26	0aaaaaaa  Enhancer: Frequency	
00 00 27#	0bbbbbb	10...100 = 1.0...10.0kHz
00 00 28	0aaaaaaa  Enhancer: MIX Level	

00 00 29#	0bbbbbb	0...100
00 00 2A	0aaaaaa  Enhancer: Level	
00 00 2B#	0bbbbbb	0...100
00 00 2C	0aaaaaa  EQ: Low EQ Type	
00 00 2D#	0bbbbbb	0,1 = Shelving, Peaking
00 00 2E	0aaaaaa  EQ: Low EQ Gain	
00 00 2F#	0bbbbbb	-12...12dB
00 00 30	0aaaaaa  EQ: Low EQ Frequency	
00 00 31#	0bbbbbb	2...200 = 20...2000Hz
00 00 32	0aaaaaa  EQ: Low EQ Q	
00 00 33#	0bbbbbb	3...100 = 0.3...10.0
00 00 34	0aaaaaa  EQ: Mid EQ Gain	
00 00 35#	0bbbbbb	-12...12dB
00 00 36	0aaaaaa  EQ: Mid EQ Frequency	
00 00 37#	0bbbbbb	20...800 = 200...8000Hz
00 00 38	0aaaaaa  EQ: Mid EQ Q	
00 00 39#	0bbbbbb	3...100 = 0.3...10.0
00 00 3A	0aaaaaa  EQ: High EQ Type	
00 00 3B#	0bbbbbb	0,1 = Shelving, Peaking
00 00 3C	0aaaaaa  EQ: High EQ Gain	
00 00 3D#	0bbbbbb	-12...12dB
00 00 3E	0aaaaaa  EQ: High EQ Frequency	
00 00 3F#	0bbbbbb	14...200 = 1.4...20.0kHz
00 00 40	0aaaaaa  EQ: High EQ Q	
00 00 41#	0bbbbbb	3...100 = 0.3...10.0
00 00 42	0aaaaaa  EQ: Cut Level	
00 00 43#	0bbbbbb	0...100
00 00 44	00   (Reserved)	
:	:	
00 00 7F	00	

Algorithm 20 Reverb 2

00 00 0E	0aaaaaa  Reverb SW	
00 00 0F#	0bbbbbb	0,1 = Off,On
00 00 10	0aaaaaa  EQ SW	
00 00 11#	0bbbbbb	0,1 = Off,On
00 00 12	0aaaaaa  Reverb 2: Reverb Type	
00 00 13#	0bbbbbb	0...4 = Room1,Room2,Hall1,Hall2,Plate
00 00 14	0aaaaaa  Reverb 2: Reverb Time	
00 00 15#	0bbbbbb	1...100 = 0.1...10.0sec
00 00 16	0aaaaaa  Reverb 2: Pre Delay	
00 00 17#	0bbbbbb	0...200msec
00 00 18	0aaaaaa  Reverb 2: Density	
00 00 19#	0bbbbbb	0...100
00 00 1A	0aaaaaa  Reverb 2: High Pass Filter	
00 00 1B#	0bbbbbb	10...200 = Thru,20...2000Hz
00 00 1C	0aaaaaa  Reverb 2: Low Pass Filter	
00 00 1D#	0bbbbbb	10...201 = 1.0...20.0kHz,Thru
00 00 1E	0aaaaaa  Reverb 2: Effect Level	
00 00 1F#	0bbbbbb	0...100
00 00 20	0aaaaaa  Reverb 2: Direct Level	
00 00 21#	0bbbbbb	0...100

00 00 22	0aaaaaa  Reverb 2: Gate SW	
00 00 23#	0bbbbbb	0,1 = Off,On
00 00 24	0aaaaaa  Reverb 2: Gate Mode	
00 00 25#	0bbbbbb	0,1 = Gate,Ducking
00 00 26	0aaaaaa  Reverb 2: Gate Threshold	
00 00 27#	0bbbbbb	0...100
00 00 28	0aaaaaa  Reverb 2: Gate Attack Time	
00 00 29#	0bbbbbb	1...100
00 00 2A	0aaaaaa  Reverb 2: Gate Release Time	
00 00 2B#	0bbbbbb	1...100
00 00 2C	0aaaaaa  Reverb 2: Gate Hold Time	
00 00 2D#	0bbbbbb	1...100
00 00 2E	0aaaaaa  EQ: Low EQ Type	
00 00 2F#	0bbbbbb	0,1 = Shelving, Peaking
00 00 30	0aaaaaa  EQ: Low EQ Gain	
00 00 31#	0bbbbbb	-12...12dB
00 00 32	0aaaaaa  EQ: Low EQ Frequency	
00 00 33#	0bbbbbb	2...200 = 20...2000Hz
00 00 34	0aaaaaa  EQ: Low EQ Q	
00 00 35#	0bbbbbb	3...100 = 0.3...10.0
00 00 36	0aaaaaa  EQ: Mid EQ Gain	
00 00 37#	0bbbbbb	-12...12dB
00 00 38	0aaaaaa  EQ: Mid EQ Frequency	
00 00 39#	0bbbbbb	20...800 = 200...8000Hz
00 00 3A	0aaaaaa  EQ: Mid EQ Q	
00 00 3B#	0bbbbbb	3...100 = 0.3...10.0
00 00 3C	0aaaaaa  EQ: High EQ Type	
00 00 3D#	0bbbbbb	0,1 = Shelving, Peaking
00 00 3E	0aaaaaa  EQ: High EQ Gain	
00 00 3F#	0bbbbbb	-12...12dB
00 00 40	0aaaaaa  EQ: High EQ Frequency	
00 00 41#	0bbbbbb	14...200 = 1.4...20.0kHz
00 00 42	0aaaaaa  EQ: High EQ Q	
00 00 43#	0bbbbbb	3...100 = 0.3...10.0
00 00 44	0aaaaaa  EQ: Cut Level	
00 00 45#	0bbbbbb	0...100
00 00 46	00   (Reserved)	
:	:	
00 00 7F	00	

Algorithm 21 Space Chorus

00 00 0E	0aaaaaa  Chorus SW	
00 00 0F#	0bbbbbb	0,1 = Off,On
00 00 10	0aaaaaa  Chorus: Input Mode	
00 00 11#	0bbbbbb	0,1 = Mono,Stereo
00 00 12	0aaaaaa  Chorus: Mode	
00 00 13#	0bbbbbb	0...6 = 1.2.3.4.1+4.2+4.3+4
00 00 14	0aaaaaa  Chorus: Mix Balance	
00 00 15#	0bbbbbb	0...100
00 00 16	00   (Reserved)	
:	:	
00 00 7F	00	

# MIDI Implementation

## Algorithm 22 Lo-Fi Processor

00 00 0E	0aaaaaaa	Lo-Fi Processor SW	
00 00 0F#	0bbbbbbb		0,1 = Off,On
00 00 10	0aaaaaaa	Realtime Modify Filter SW	
00 00 11#	0bbbbbbb		0,1 = Off,On
00 00 12	0aaaaaaa	Lo-Fi Processor: Pre Filter SW	
00 00 13#	0bbbbbbb		0,1 = Off,On
00 00 14	0aaaaaaa	Lo-Fi Processor: Rate	
00 00 15#	0bbbbbbb		0,,,31 = Off,1/2,,,1/32
00 00 16	0aaaaaaa	Lo-Fi Processor: Number of Bit	
00 00 17#	0bbbbbbb		0,,,15 = Off,15...1bit
00 00 18	0aaaaaaa	Lo-Fi Processor: Post Filter SW	
00 00 19#	0bbbbbbb		0,1 = Off,On
00 00 1A	0aaaaaaa	Lo-Fi Processor: Effect Level	
00 00 1B#	0bbbbbbb		0,,,100
00 00 1C	0aaaaaaa	Lo-Fi Processor: Direct Level	
00 00 1D#	0bbbbbbb		0,,,100
00 00 1E	0aaaaaaa	Realtime Modify Filter: Filter Type	
00 00 1F#	0bbbbbbb		0,,,2 = LPF,BPF,HPF
00 00 20	0aaaaaaa	Realtime Modify Filter: Cut Off	
00 00 21#	0bbbbbbb		0,,,100
00 00 22	0aaaaaaa	Realtime Modify Filter: Resonance	
00 00 23#	0bbbbbbb		0,,,100
00 00 24	0aaaaaaa	Realtime Modify Filter: Gain	
00 00 25#	0bbbbbbb		0,,,24dB
00 00 26	0aaaaaaa	Noise Suppressor: Threshold	
00 00 27#	0bbbbbbb		0,,,100
00 00 28	0aaaaaaa	Noise Suppressor: Release	
00 00 29#	0bbbbbbb		0,,,100
00 00 2A	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 23 4 Band Parametric EQ

00 00 0E	0aaaaaaa	Parametric EQ Link SW	
00 00 0F#	0bbbbbbb		0,1 = Off,On
00 00 10	0aaaaaaa	Parametric EQ Ach SW	
00 00 11#	0bbbbbbb		0,1 = Off,On
00 00 12	0aaaaaaa	Parametric EQ Bch SW	
00 00 13#	0bbbbbbb		0,1 = Off,On
00 00 14	0aaaaaaa	EQ Ach: Input Level	
00 00 15#	0bbbbbbb		-60,,,12dB
00 00 16	0aaaaaaa	EQ Ach: Low EQ Type	
00 00 17#	0bbbbbbb		0,1 = Shelving, Peaking
00 00 18	0aaaaaaa	EQ Ach: Low EQ Gain	
00 00 19#	0bbbbbbb		-12,,,12dB
00 00 1A	0aaaaaaa	EQ Ach: Low EQ Frequency	
00 00 1B#	0bbbbbbb		2,,,200 = 20,,,2000Hz
00 00 1C	0aaaaaaa	EQ Ach: Low EQ Q	
00 00 1D#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 1E	0aaaaaaa	EQ Ach: Low Mid EQ Gain	
00 00 1F#	0bbbbbbb		-12,,,12dB

00 00 20	0aaaaaaa	EQ Ach: Low Mid EQ Frequency	
00 00 21#	0bbbbbbb		20,,,800 = 200,,,8000Hz
00 00 22	0aaaaaaa	EQ Ach: Low Mid EQ Q	
00 00 23#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 24	0aaaaaaa	EQ Ach: High Mid EQ Gain	
00 00 25#	0bbbbbbb		-12,,,12dB
00 00 26	0aaaaaaa	EQ Ach: High Mid EQ Frequency	
00 00 27#	0bbbbbbb		20,,,800 = 200,,,8000Hz
00 00 28	0aaaaaaa	EQ Ach: High Mid EQ Q	
00 00 29#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 2A	0aaaaaaa	EQ Ach: High EQ Type	
00 00 2B#	0bbbbbbb		0,1 = Shelving, Peaking
00 00 2C	0aaaaaaa	EQ Ach: High EQ Gain	
00 00 2D#	0bbbbbbb		-12,,,12dB
00 00 2E	0aaaaaaa	EQ Ach: High EQ Frequency	
00 00 2F#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
00 00 30	0aaaaaaa	EQ Ach: High EQ Q	
00 00 31#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 32	0aaaaaaa	EQ Ach: Output Level	
00 00 33#	0bbbbbbb		-60,,,12dB
00 00 34	0aaaaaaa	EQ Bch: Input Level	
00 00 35#	0bbbbbbb		-60,,,12dB
00 00 36	0aaaaaaa	EQ Bch: Low EQ Type	
00 00 37#	0bbbbbbb		0,1 = Shelving, Peaking
00 00 38	0aaaaaaa	EQ Bch: Low EQ Gain	
00 00 39#	0bbbbbbb		-12,,,12dB
00 00 3A	0aaaaaaa	EQ Bch: Low EQ Frequency	
00 00 3B#	0bbbbbbb		2,,,200 = 20,,,2000Hz
00 00 3C	0aaaaaaa	EQ Bch: Low EQ Q	
00 00 3D#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 3E	0aaaaaaa	EQ Bch: Low Mid EQ Gain	
00 00 3F#	0bbbbbbb		-12,,,12dB
00 00 40	0aaaaaaa	EQ Bch: Low Mid EQ Frequency	
00 00 41#	0bbbbbbb		20,,,800 = 200,,,8000Hz
00 00 42	0aaaaaaa	EQ Bch: Low Mid EQ Q	
00 00 43#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 44	0aaaaaaa	EQ Bch: High Mid EQ Gain	
00 00 45#	0bbbbbbb		-12,,,12dB
00 00 46	0aaaaaaa	EQ Bch: High Mid EQ Frequency	
00 00 47#	0bbbbbbb		20,,,800 = 200,,,8000Hz
00 00 48	0aaaaaaa	EQ Bch: High Mid EQ Q	
00 00 49#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 4A	0aaaaaaa	EQ Bch: High EQ Type	
00 00 4B#	0bbbbbbb		0,1 = Shelving, Peaking
00 00 4C	0aaaaaaa	EQ Bch: High EQ Gain	
00 00 4D#	0bbbbbbb		-12,,,12dB
00 00 4E	0aaaaaaa	EQ Bch: High EQ Frequency	
00 00 4F#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
00 00 50	0aaaaaaa	EQ Bch: High EQ Q	
00 00 51#	0bbbbbbb		3,,,100 = 0.3,,,10.0
00 00 52	0aaaaaaa	EQ Bch: Output Level	
00 00 53#	0bbbbbbb		-60,,,12dB
00 00 54	00	(Reserved)	

```
00 00 7F 00
```

\* When Link SW = On, Bch corresponds to Ach.

Algorithm 24 10 Band Graphic EQ

00 00 0E	0aaaaaa	Graphic EQ Link SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	Graphic EQ Ach SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Graphic EQ Bch SW	
00 00 13#	0bbbbbb		0,1 = Off,On
00 00 14	0aaaaaa	EQ Ach: Input Gain	
00 00 15#	0bbbbbb		-60...12dB
00 00 16	0aaaaaa	EQ Ach: 31.25Hz Gain	
00 00 17#	0bbbbbb		-15...15dB
00 00 18	0aaaaaa	EQ Ach: 62.5Hz Gain	
00 00 19#	0bbbbbb		-15...15dB
00 00 1A	0aaaaaa	EQ Ach: 125Hz Gain	
00 00 1B#	0bbbbbb		-15...15dB
00 00 1C	0aaaaaa	EQ Ach: 250Hz Gain	
00 00 1D#	0bbbbbb		-15...15dB
00 00 1E	0aaaaaa	EQ Ach: 500Hz Gain	
00 00 1F#	0bbbbbb		-15...15dB
00 00 20	0aaaaaa	EQ Ach: 1.0kHz Gain	
00 00 21#	0bbbbbb		-15...15dB
00 00 22	0aaaaaa	EQ Ach: 2.0kHz Gain	
00 00 23#	0bbbbbb		-15...15dB
00 00 24	0aaaaaa	EQ Ach: 4.0kHz Gain	
00 00 25#	0bbbbbb		-15...15dB
00 00 26	0aaaaaa	EQ Ach: 8.0kHz Gain	
00 00 27#	0bbbbbb		-15...15dB
00 00 28	0aaaaaa	EQ Ach: 16.0kHz Gain	
00 00 29#	0bbbbbb		-15...15dB
00 00 2A	0aaaaaa	EQ Ach: Output Level	
00 00 2B#	0bbbbbb		-60...12dB
00 00 2C	0aaaaaa	EQ Bch: Input Gain	
00 00 2D#	0bbbbbb		-60...12dB
00 00 2E	0aaaaaa	EQ Bch: 31.25Hz Gain	
00 00 2F#	0bbbbbb		-15...15dB
00 00 30	0aaaaaa	EQ Bch: 62.5Hz Gain	
00 00 31#	0bbbbbb		-15...15dB
00 00 32	0aaaaaa	EQ Bch: 125Hz Gain	
00 00 33#	0bbbbbb		-15...15dB
00 00 34	0aaaaaa	EQ Bch: 250Hz Gain	
00 00 35#	0bbbbbb		-15...15dB
00 00 36	0aaaaaa	EQ Bch: 500Hz Gain	
00 00 37#	0bbbbbb		-15...15dB
00 00 38	0aaaaaa	EQ Bch: 1.0kHz Gain	
00 00 39#	0bbbbbb		-15...15dB
00 00 3A	0aaaaaa	EQ Bch: 2.0kHz Gain	
00 00 3B#	0bbbbbb		-15...15dB
00 00 3C	0aaaaaa	EQ Bch: 4.0kHz Gain	

00 00 3D#	0bbbbbb		-15...15dB
00 00 3E	0aaaaaa	EQ Bch: 8.0kHz Gain	
00 00 3F#	0bbbbbb		-15...15dB
00 00 40	0aaaaaa	EQ Bch: 16.0kHz Gain	
00 00 41#	0bbbbbb		-15...15dB
00 00 42	0aaaaaa	EQ Bch: Output Level	
00 00 43#	0bbbbbb		-60...12dB
00 00 44	00	(Reserved)	
:	:		
00 00 7F	00		

\* When Link SW = On, Bch corresponds to Ach.

Algorithm 25 Hum Canceler

00 00 0E	0aaaaaa	Hum Canceler SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	Noise Suppressor SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Hum Canceler: Freq	
00 00 13#	0bbbbbb		200...8000 = 20.0...800.0Hz
00 00 14	0aaaaaa	Hum Canceler: Width	
00 00 15#	0bbbbbb		10...40%
00 00 16	0aaaaaa	Hum Canceler: Depth	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaa	Hum Canceler: Threshold	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	Hum Canceler: Range Low	
00 00 1B#	0bbbbbb		1...200 = Unlimit,20...2000Hz
00 00 1C	0aaaaaa	Hum Canceler: Range High	
00 00 1D#	0bbbbbb		10...201 = 1.0...20.0kHz,Unlimit
00 00 1E	0aaaaaa	Noise Suppressor: Threshold	
00 00 1F#	0bbbbbb		0...100
00 00 20	0aaaaaa	Noise Suppressor: Release	
00 00 21#	0bbbbbb		0...100
00 00 22	00	(Reserved)	
:	:		
00 00 7F	00		

Algorithm 26 Vocal Canceled

00 00 0E	0aaaaaa	Vocal Canceled SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	EQ SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	0aaaaaa	Vocal Canceled: Balance	
00 00 13#	0bbbbbb		0...100
00 00 14	0aaaaaa	Vocal Canceled: Range Low	
00 00 15#	0bbbbbb		1...200 = Unlimit,20...2000Hz
00 00 16	0aaaaaa	Vocal Canceled: Range High	
00 00 17#	0bbbbbb		10...201 = 1.0...20.0kHz,Unlimit
00 00 18	0aaaaaa	EQ: Low EQ Type	
00 00 19#	0bbbbbb		0,1 = Shelving, Peaking
00 00 1A	0aaaaaa	EQ: Low EQ Gain	
00 00 1B#	0bbbbbb		-12...12dB

# MIDI Implementation

00 00 1C	0aaaaaa	EQ: Low EQ Frequency	
00 00 1D#	0bbbbbb		2,,,200 = 20,,,200Hz
00 00 1E	0aaaaaa	EQ: Low EQ Q	
00 00 1F#	0bbbbbb		3,,,100 = 0.3,,,10.0
00 00 20	0aaaaaa	EQ: Mid EQ Gain	
00 00 21#	0bbbbbb		-12,,,12dB
00 00 22	0aaaaaa	EQ: Mid EQ Frequency	
00 00 23#	0bbbbbb		20,,,800 = 200,,,800Hz
00 00 24	0aaaaaa	EQ: Mid EQ Q	
00 00 25#	0bbbbbb		3,,,100 = 0.3,,,10.0
00 00 26	0aaaaaa	EQ: High EQ Type	
00 00 27#	0bbbbbb		0,1 = Shelving, Peaking
00 00 28	0aaaaaa	EQ: High EQ Gain	
00 00 29#	0bbbbbb		-12,,,12dB
00 00 2A	0aaaaaa	EQ: High EQ Frequency	
00 00 2B#	0bbbbbb		14,,,200 = 1.4,,,20.0kHz
00 00 2C	0aaaaaa	EQ: High EQ Q	
00 00 2D#	0bbbbbb		3,,,100 = 0.3,,,10.0
00 00 2E	0aaaaaa	EQ: Out Level	
00 00 2F#	0bbbbbb		0,,,100
00 00 30	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 27 Voice Transformer (FX1, FX3, FX5 or FX7)

00 00 0E	0aaaaaa	Voice Transformer SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	Reverb SW	
00 00 11#	0bbbbbb		0,1 = Off,On
00 00 12	00	(Reserved)	
00 00 13#	00		
00 00 14	00	(Reserved)	
00 00 15#	00		
00 00 16	0aaaaaa	Voice Transformer: Robot SW	
00 00 17#	0bbbbbb		0,1 = Off,On
00 00 18	0aaaaaa	Voice Transformer: Chromatic Pitch	
00 00 19#	0bbbbbb		-12,,,36
00 00 1A	0aaaaaa	Voice Transformer: Fine Pitch	
00 00 1B#	0bbbbbb		-100,,,100
00 00 1C	0aaaaaa	Voice Transformer: Chromatic Formant	
00 00 1D#	0bbbbbb		-12,,,12
00 00 1E	0aaaaaa	Voice Transformer: Fine Formant	
00 00 1F#	0bbbbbb		-100,,,100
00 00 20	0aaaaaa	Voice Transformer: Mix Balance	
00 00 21#	0bbbbbb		0,,,100
00 00 22	0aaaaaa	Reverb: Reverb Time	
00 00 23#	0bbbbbb		1,,,100 = 0.1,,,10.0sec
00 00 24	0aaaaaa	Reverb: Pre Delay	
00 00 25#	0bbbbbb		0,,,200msec
00 00 26	0aaaaaa	Reverb: Density	
00 00 27#	0bbbbbb		0,,,100
00 00 28	0aaaaaa	Reverb: Effect Level	
00 00 29#	0bbbbbb		0,,,100

00 00 2A	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 28 Vocoder 2 (FX1, FX3, FX5 or FX7)

00 00 0E	0aaaaaa	Chorus SW	
00 00 0F#	0bbbbbb		0,1 = Off,On
00 00 10	0aaaaaa	Vocoder: Envelope Mode	
00 00 11#	0bbbbbb		0,,,2 = Sharp,Soft,Long
00 00 12	0aaaaaa	Vocoder: Pan Mode	
00 00 13#	0bbbbbb		0,,,3 = Mono,Stereo,L->R,R->L
00 00 14	0aaaaaa	Vocoder: Hold	
00 00 15#	0bbbbbb		0,1 = Off,On
00 00 16	0aaaaaa	Vocoder: Mic Sens	
00 00 17#	0bbbbbb		0,,,100
00 00 18	0aaaaaa	Vocoder: Synth Input Level	
00 00 19#	0bbbbbb		0,,,100
00 00 1A	0aaaaaa	Vocoder: Voice Char Level 1	
00 00 1B#	0bbbbbb		0,,,100
00 00 1C	0aaaaaa	Vocoder: Voice Char Level 2	
00 00 1D#	0bbbbbb		0,,,100
00 00 1E	0aaaaaa	Vocoder: Voice Char Level 3	
00 00 1F#	0bbbbbb		0,,,100
00 00 20	0aaaaaa	Vocoder: Voice Char Level 4	
00 00 21#	0bbbbbb		0,,,100
00 00 22	0aaaaaa	Vocoder: Voice Char Level 5	
00 00 23#	0bbbbbb		0,,,100
00 00 24	0aaaaaa	Vocoder: Voice Char Level 6	
00 00 25#	0bbbbbb		0,,,100
00 00 26	0aaaaaa	Vocoder: Voice Char Level 7	
00 00 27#	0bbbbbb		0,,,100
00 00 28	0aaaaaa	Vocoder: Voice Char Level 8	
00 00 29#	0bbbbbb		0,,,100
00 00 2A	0aaaaaa	Vocoder: Voice Char Level 9	
00 00 2B#	0bbbbbb		0,,,100
00 00 2C	0aaaaaa	Vocoder: Voice Char Level 10	
00 00 2D#	0bbbbbb		0,,,100
00 00 2E	0aaaaaa	Vocoder: Voice Char Level 11	
00 00 2F#	0bbbbbb		0,,,100
00 00 30	0aaaaaa	Vocoder: Voice Char Level 12	
00 00 31#	0bbbbbb		0,,,100
00 00 32	0aaaaaa	Vocoder: Voice Char Level 13	
00 00 33#	0bbbbbb		0,,,100
00 00 34	0aaaaaa	Vocoder: Voice Char Level 14	
00 00 35#	0bbbbbb		0,,,100
00 00 36	0aaaaaa	Vocoder: Voice Char Level 15	
00 00 37#	0bbbbbb		0,,,100
00 00 38	0aaaaaa	Vocoder: Voice Char Level 16	
00 00 39#	0bbbbbb		0,,,100
00 00 3A	0aaaaaa	Vocoder: Voice Char Level 17	
00 00 3B#	0bbbbbb		0,,,100
00 00 3C	0aaaaaa	Vocoder: Voice Char Level 18	

00 00 3D#	0bbbbbb	0...100
00 00 3E	0aaaaaa	Vocoder: Voice Char Level 19
00 00 3F#	0bbbbbb	0...100
00 00 40	0aaaaaa	Vocoder: Mic High Pass Filter
00 00 41#	0bbbbbb	9...200 = Thru,1.0...20.0kHz
00 00 42	0aaaaaa	Vocoder: Mic High Pass Filter Pan
00 00 43#	0bbbbbb	1...127 = L63...R63
00 00 44	0aaaaaa	Vocoder: Mic Mix
00 00 45#	0bbbbbb	0...100
00 00 46	0aaaaaa	Vocoder: Noise Suppressor Threshold
00 00 47#	0bbbbbb	0...100
00 00 48	0aaaaaa	Chorus: Rate
00 00 49#	0bbbbbb	1...100 = 0.1...10.0Hz
00 00 4A	0aaaaaa	Chorus: Depth
00 00 4B#	0bbbbbb	0...100
00 00 4C	0aaaaaa	Chorus: Pre Delay
00 00 4D#	0bbbbbb	0...50ms
00 00 4E	0aaaaaa	Chorus: Mix Balance
00 00 4F#	0bbbbbb	0...100
00 00 50	00	(Reserved)
:	:	:
00 00 7F	00	

Algorithm 29 Mic Simulator

00 00 0E	0aaaaaa	Link SW
00 00 0F#	0bbbbbb	0.1 = Off,On
00 00 10	0aaaaaa	Mic Converter Ach SW
00 00 11#	0bbbbbb	0.1 = Off,On
00 00 12	0aaaaaa	Bass Cut Ach SW
00 00 13#	0bbbbbb	0.1 = Off,On
00 00 14	0aaaaaa	Distance Ach SW
00 00 15#	0bbbbbb	0.1 = Off,On
00 00 16	0aaaaaa	Limiter Ach SW
00 00 17#	0bbbbbb	0.1 = Off,On
00 00 18	0aaaaaa	Mic Converter Bch SW
00 00 19#	0bbbbbb	0.1 = Off,On
00 00 1A	0aaaaaa	Bass Cut Bch SW
00 00 1B#	0bbbbbb	0.1 = Off,On
00 00 1C	0aaaaaa	Distance Bch SW
00 00 1D#	0bbbbbb	0.1 = Off,On
00 00 1E	0aaaaaa	Limiter Bch SW
00 00 1F#	0bbbbbb	0.1 = Off,On
00 00 20	0aaaaaa	Mic Converter Ach: Input
00 00 21#	0bbbbbb	0...4 = DR-20, SmlDy, HedDy, MinCn, Flat
00 00 22	0aaaaaa	Mic Converter Ach: Output
00 00 23#	0bbbbbb	0...6 = SmlDy, VocDy, LrgDy, SmlCn, LrgCn, VntCn, Flat
00 00 24	0aaaaaa	Mic Converter Ach: Phase
00 00 25#	0bbbbbb	0.1 = Normal, Inverse
00 00 26	0aaaaaa	Bass Cut Ach: Bass Cut Frequency
00 00 27#	0bbbbbb	1...200 = Thru, 20...2000Hz
00 00 28	0aaaaaa	Distance Ach: Proximity Effect
00 00 29#	0bbbbbb	-12...+12

00 00 2A	0aaaaaa	Distance Ach: TimeLag
00 00 2B#	0bbbbbb	0...1000 = 0...3000cm
00 00 2C	0aaaaaa	Limiter Ach: Detect HPF Frequency
00 00 2D#	0bbbbbb	1...200 = Thru, 20...2000Hz
00 00 2E	0aaaaaa	Limiter Ach: Level
00 00 2F#	0bbbbbb	-60...+24dB
00 00 30	0aaaaaa	Limiter Ach: Threshold
00 00 31#	0bbbbbb	-60...0dB
00 00 32	0aaaaaa	Limiter Ach: Attack
00 00 33#	0bbbbbb	0...100
00 00 34	0aaaaaa	Limiter Ach: Release
00 00 35#	0bbbbbb	0...100
00 00 36	0aaaaaa	Mic Converter Bch: Input
00 00 37#	0bbbbbb	0...4 = DR-20, SmlDy, HedDy, MinCn, Flat
00 00 38	0aaaaaa	Mic Converter Bch: Output
00 00 39#	0bbbbbb	0...6 = SmlDy, VocDy, LrgDy, SmlCn, LrgCn, VntCn, Flat
00 00 3A	0aaaaaa	Mic Converter Bch: Phase
00 00 3B#	0bbbbbb	0.1 = Normal, Inverse
00 00 3C	0aaaaaa	Bass Cut Bch: Bass Cut Frequency
00 00 3D#	0bbbbbb	1...200 = Thru, 20...2000Hz
00 00 3E	0aaaaaa	Distance Bch: Proximity Effect
00 00 3F#	0bbbbbb	-12...+12
00 00 40	0aaaaaa	Distance Bch: TimeLag
00 00 41#	0bbbbbb	0...1000 = 0...3000cm
00 00 42	0aaaaaa	Limiter Bch: Detect HPF Frequency
00 00 43#	0bbbbbb	1...200 = Thru, 20...2000Hz
00 00 44	0aaaaaa	Limiter Bch: Level
00 00 45#	0bbbbbb	-60...+24dB
00 00 46	0aaaaaa	Limiter Bch: Threshold
00 00 47#	0bbbbbb	-60...0dB
00 00 48	0aaaaaa	Limiter Bch: Attack
00 00 49#	0bbbbbb	0...100
00 00 4A	0aaaaaa	Limiter Bch: Release
00 00 4B#	0bbbbbb	0...100
00 00 4C	00	(Reserved)
:	:	:
00 00 7F	00	

- \* When Mic Converter Input = MinCn, Output is fixed to SmlDy or LrgCn.
- \* When Link SW = On, Bch corresponds to Ach.

Algorithm 30 3 Band Isolator

00 00 0E	0aaaaaa	Isolator SW
00 00 0F#	0bbbbbb	0.1 = Off,On
00 00 10	0aaaaaa	Isolator High Volume
00 00 11#	0bbbbbb	-60...+4dB
00 00 12	0aaaaaa	Isolator Middle Volume
00 00 13#	0bbbbbb	-60...+4dB
00 00 14	0aaaaaa	Isolator Low Volume
00 00 15#	0bbbbbb	-60...+4dB
00 00 16	0aaaaaa	Isolator Anti Phase Middle Switch
00 00 17#	0bbbbbb	0.1 = Off,On
00 00 18	0aaaaaa	Isolator Anti Phase Middle Level
00 00 19#	0bbbbbb	0...100

# MIDI Implementation

00 00 1A	0aaaaaa	Isolator Anti Phase Low Switch	
00 00 1B#	0bbbbbb		0.1 = Off,On
00 00 1C	0aaaaaa	Isolator Anti Phase Low Level	
00 00 1D#	0bbbbbb		0...100
00 00 1E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 31 Tape Echo 201

00 00 0E	0aaaaaa	Tape Echo SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	Tape Echo Mode Select	
00 00 11#	0bbbbbb		0...6 = 1...7
00 00 12	0aaaaaa	Tape Echo Repeat Rate	
00 00 13#	0bbbbbb		0...100
00 00 14	0aaaaaa	Tape Echo Intensity	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaa	Tape Echo Effect Level	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaa	Tape Echo Direct Level	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	Tape Echo Tone Bass	
00 00 1B#	0bbbbbb		-100...100
00 00 1C	0aaaaaa	Tape Echo Tone Treble	
00 00 1D#	0bbbbbb		-100...100
00 00 1E	0aaaaaa	Tape Echo Tape Head S Pan	
00 00 1F#	0bbbbbb		1...127 = L63...R63
00 00 20	0aaaaaa	Tape Echo Tape Head M Pan	
00 00 21#	0bbbbbb		1...127 = L63...R63
00 00 22	0aaaaaa	Tape Echo Tape Head L Pan	
00 00 23#	0bbbbbb		1...127 = L63...R63
00 00 24	0aaaaaa	Tape Echo Tape Distortion	
00 00 25#	0bbbbbb		0...100
00 00 26	0aaaaaa	Tape Echo Wah Flutter Rate	
00 00 27#	0bbbbbb		0...100
00 00 28	0aaaaaa	Tape Echo Wah Flutter Depth	
00 00 29#	0bbbbbb		0...100
00 00 2A	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 32 Analog Flanger

00 00 0E	0aaaaaa	Analog Flanger SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	Analog Flanger Mode	
00 00 11#	0bbbbbb		0...3 = FL1,FL2,FL3,CHO
00 00 12	0aaaaaa	Analog Flanger Feedback	
00 00 13#	0bbbbbb		0...100
00 00 14	0aaaaaa	Analog Flanger Modulation Rate	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaa	Analog Flanger Modulation Depth	
00 00 17#	0bbbbbb		0...100

00 00 18	0aaaaaa	Analog Flanger Modulation Frequency	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	Analog Flanger Channel B Modulation	
00 00 1B#	0bbbbbb		0.1 = Nor,Inv
00 00 1C	0aaaaaa	Analog Flanger Channel A Phase	
00 00 1D#	0bbbbbb		0.1 = Nor,Inv
00 00 1E	0aaaaaa	Analog Flanger Channel B Phase	
00 00 1F#	0bbbbbb		0.1 = Nor,Inv
00 00 20	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 33 Analog Phaser

00 00 0E	0aaaaaa	Analog Phaser SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	Analog Phaser Mode	
00 00 11#	0bbbbbb		0.1 = 4STAGE,6STAGE
00 00 12	0aaaaaa	Analog Phaser Frequency	
00 00 13#	0bbbbbb		0...100
00 00 14	0aaaaaa	Analog Phaser Resonance	
00 00 15#	0bbbbbb		0...100
00 00 16	0aaaaaa	Analog Phaser LFO 1 Rate	
00 00 17#	0bbbbbb		0...100
00 00 18	0aaaaaa	Analog Phaser LFO 1 Depth	
00 00 19#	0bbbbbb		0...100
00 00 1A	0aaaaaa	Analog Phaser LFO 1 Channel B Mod	
00 00 1B#	0bbbbbb		0.1 = Nor,Inv
00 00 1C	0aaaaaa	Analog Phaser LFO 2 Rate	
00 00 1D#	0bbbbbb		0...100
00 00 1E	0aaaaaa	Analog Phaser LFO 2 Depth	
00 00 1F#	0bbbbbb		0...100
00 00 20	0aaaaaa	Analog Phaser LFO 2 Channel B Mod	
00 00 21#	0bbbbbb		0.1 = Nor,Inv
00 00 22	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 34 FFT (FX1, FX3, FX5 or FX7)

00 00 0E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

## Algorithm 35 Speaker Modeling / Master Effect Algorithm 0

00 00 0E	0aaaaaa	Speaker Modeling SW	
00 00 0F#	0bbbbbb		0.1 = Off,On
00 00 10	0aaaaaa	Bass Cut SW	
00 00 11#	0bbbbbb		0.1 = Off,On
00 00 12	0aaaaaa	Low Frequency Trimmer SW	
00 00 13#	0bbbbbb		0.1 = Off,On
00 00 14	0aaaaaa	High Frequency Trimmer SW	
00 00 15#	0bbbbbb		0.1 = Off,On
00 00 16	0aaaaaa	Limiter SW	
00 00 17#	0bbbbbb		0.1 = Off,On



00 00 18	0aaaaaa	Output Speaker	
00 00 19#	0bbbbbb	0...5 = DS-90,MS-50,SST-151,SST-251, SST151+351,SST251+351	
00 00 1A	0aaaaaa	Modeling Speaker	
00 00 1B#	0bbbbbb	0...13 = THRU,Super Flat,Powered GenBk, Powered E-Bas,Powered Hack,Small Cube,White Cone, White C -tissue,Small Radio,Small TV,Boom Box, BoomBox LoBoost,Powerd SR,Powerd SR Stack	
00 00 1C	0aaaaaa	Speaker Modeling Phase	
00 00 1D#	0bbbbbb		0,1 = NFM,IRV
00 00 1E	0aaaaaa	Bass Cut Frequency	
00 00 1F#	0bbbbbb		1...200 = Thru,20...2000Hz
00 00 20	0aaaaaa	Low Frequency Trimmer Gain	
00 00 21#	0bbbbbb		-12...12dB
00 00 22	0aaaaaa	Low Frequency Trimmer Frequency	
00 00 23#	0bbbbbb		2...200 = 20...2000Hz
00 00 24	0aaaaaa	High Frequency Trimmer Gain	
00 00 25#	0bbbbbb		-12...12dB
00 00 26	0aaaaaa	High Frequency Trimmer Frequency	
00 00 27#	0bbbbbb		10...200 = 1.0...20.0kHz
00 00 2B	0aaaaaa	Limiter Threshold	
00 00 29#	0bbbbbb		-60...0dB
00 00 2A	0aaaaaa	Limiter Release	
00 00 2B#	0bbbbbb		0...100
00 00 2C	0aaaaaa	Limiter Level	
00 00 2D#	0bbbbbb		-60...24dB
00 00 2E	00	(Reserved)	
:	:	:	:
00 00 7F	00		

- \* When Output Speaker = 0 (DS-90), Modeling Speaker is fixed to 0 - 11.
- \* When Output Speaker = 1 (MS-50), Modeling Speaker is fixed to 0, 1.
- \* When Output Speaker = 2 (SST-151), Modeling Speaker is fixed to 0, 1, 12.
- \* When Output Speaker = 3 (SST-251), Modeling Speaker is fixed to 0, 1, 12.
- \* When Output Speaker = 4 (SST-151+351), Modeling Speaker is fixed to 0, 1, 13.
- \* When Output Speaker = 5 (SST-251+351), Modeling Speaker is fixed to 0, 1, 13.

Algorithm 36 Mastering Tool Kit (FX1, FX3, FX5 or FX7)

00 00 0E	00 - 01	EQ SW	0,1 = Off,On
00 00 0F	00 - 01	Bass Cut SW	0,1 = Off,On
00 00 10	00 - 01	Enhancer SW	0,1 = Off,On
00 00 11	00 - 01	Expander SW	0,1 = Off,On
00 00 12	00 - 01	Compressor SW	0,1 = Off,On
00 00 13	00 - 01	Limiter SW	0,1 = Off,On
00 00 14	04 - 5E	EQ: Input Gain (*2)	-30.0...15.0dB
00 00 15	00 - 01	EQ: Low EQ Type	0,1 = Shelving, Peaking
00 00 16	22 - 5E	EQ: Low EQ Gain (*2)	-15.0...15.0dB
00 00 17	04 - 54	EQ: Low EQ Frequency (*1)	20.0...2.00kHz
00 00 18	00 - 21	EQ: Low EQ Q (*3)	0.355...16.0
00 00 19	22 - 5E	EQ: Low Mid EQ Gain (*2)	-15.0...15.0dB
00 00 1A	04 - 7C	EQ: Low Mid EQ Frequency (*1)	20.0...20.0kHz

00 00 1B	00 - 21	EQ: Low Mid EQ Q (*3)	0.355...16.0
00 00 1C	22 - 5E	EQ: High Mid EQ Gain (*2)	-15.0...15.0dB
00 00 1D	04 - 7C	EQ: High Mid EQ Frequency (*1)	20.0...20.0kHz
00 00 1E	00 - 21	EQ: High Mid EQ Q (*3)	0.355...16.0
00 00 1F	00 - 01	EQ: High EQ Type	0,1 = Shelving, Peaking
00 00 20	22 - 5E	EQ: High EQ Gain (*2)	-15.0...15.0dB
00 00 21	48 - 7C	EQ: High EQ Frequency (*1)	1.00k...20.0kHz
00 00 22	00 - 21	EQ: High EQ Q (*3)	0.355...16.0
00 00 23	04 - 5E	EQ: Level (*2)	-30.0...15.0dB
00 00 24	03 - 54	Bass Cut Frequency (*1)	Thru/20.0...2.00kHz
00 00 25	00 - 64	Enhancer Sens	0...100
00 00 26	48 - 70	Enhancer Frequency (*1)	1.0k...10.0kHz
00 00 27	38 - 5C	Enhancer Mix Level (0dB:80[50H])	-24...12dB
00 00 28	38 - 5C	Input Gain (0dB:80[50H])	-24...12dB
00 00 29	00 - 0A	Input Detect Time	0...10ms
00 00 2A	04 - 44	Input Low Split Point (*1)	20.0...800Hz
00 00 2B	50 - 78	Input High Split Point (*1)	1.6k...16.0kHz
00 00 2C	00 - 50	Expander Low Threshold (0dB:80[50H])	-80...0dB
00 00 2D	00 - 50	Expander Mid Threshold (0dB:80[50H])	-80...0dB
00 00 2E	00 - 50	Expander High Threshold (0dB:80[50H])	-80...0dB
00 00 2F	00 - 0D	Expander Low Ratio (*4)	1:1.0...1:INF
00 00 30	00 - 0D	Expander Mid Ratio (*4)	1:1.0...1:INF
00 00 31	00 - 0D	Expander High Ratio (*4)	1:1.0...1:INF
00 00 32	00 - 64	Expander Low Attack	0...100ms
00 00 33	00 - 64	Expander Mid Attack	0...100ms
00 00 34	00 - 64	Expander High Attack	0...100ms
00 00 35	00 - 64	Expander Low Release (*5)	50...5000ms
00 00 36	00 - 64	Expander Mid Release (*5)	50...5000ms
00 00 37	00 - 64	Expander High Release (*5)	50...5000ms
00 00 38	38 - 50	Compressor Low Threshold (0dB:80[50H])	-24...0dB
00 00 39	38 - 50	Compressor Mid Threshold (0dB:80[50H])	-24...0dB
00 00 3A	38 - 50	Compressor High Threshold (0dB:80[50H])	-24...0dB
00 00 3B	00 - 0D	Compressor Low Ratio (*4)	1:1.0...1:INF
00 00 3C	00 - 0D	Compressor Mid Ratio (*4)	1:1.0...1:INF
00 00 3D	00 - 0D	Compressor High Ratio (*4)	1:1.0...1:INF
00 00 3E	00 - 64	Compressor Low Attack	0...100ms
00 00 3F	00 - 64	Compressor Mid Attack	0...100ms
00 00 40	00 - 64	Compressor High Attack	0...100ms
00 00 41	00 - 64	Compressor Low Release (*5)	50...5000ms
00 00 42	00 - 64	Compressor Mid Release (*5)	50...5000ms

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00 00 43	00 - 64	Compressor High Release (*5)	50,,,500ms
00 00 44	00 - 56	Mixer Low Level (0dB:80[50H])	-80,,,6dB
00 00 45	00 - 56	Mixer Mid Level (0dB:80[50H])	-80,,,6dB
00 00 46	00 - 56	Mixer High Level (0dB:80[50H])	-80,,,6dB
00 00 47	38 - 50	Limiters Threshold (0dB:80[50H])	-24,,,0dB
00 00 48	00 - 64	Limiters Attack	0,,,100ms
00 00 49	00 - 64	Limiters Release (*5)	50,,,500ms
00 00 4A	00 - 56	Output Level (0dB:80[50H])	-80,,,6dB
00 00 4B	00 - 01	Output Soft Clip	0,1 = Off,On
00 00 4C	00	(Reserved)	:
00 00 7F	00		

- (\*) See "MIDI Data - Mixer EQ Freq Table."
- (\*) See "MIDI Data - Mixer EQ Gain Table."
- (\*) See "MIDI Data - Mixer EQ Quality Table."
- (\*) See "MIDI Data - EXP/CMP Ratio Table."
- (\*) Time (ms) = 50.0 x pow (100.0, Data/100.0)

## Algorithm 37 31Band Graphic Equalizer (FX1, FX3, FX5 or FX7)

00 00 0E	00 - 01	Link SW	0,1 = Off,On
00 00 0F	00 - 01	Ach Bass Cut SW	0,1 = Off,On
00 00 10	00 - 01	Ach EQ SW	0,1 = Off,On
00 00 11	00 - 01	Bch Bass Cut SW	0,1 = Off,On
00 00 12	00 - 01	Bch EQ SW	0,1 = Off,On
00 00 13	03 - 54	Ach Bass Cut Frequency (*1)	Thru/20.0...2.00kHz
00 00 14	04 - 5E	Ach EQ Input Level (*2)	-30.0...15.0dB
00 00 15	22 - 5E	Ach EQ Band1 Gain (20.0Hz) (*2)	-15.0...15.0dB
00 00 16	22 - 5E	Ach EQ Band2 Gain (25.0Hz) (*2)	-15.0...15.0dB
00 00 17	22 - 5E	Ach EQ Band3 Gain (31.5Hz) (*2)	-15.0...15.0dB
00 00 18	22 - 5E	Ach EQ Band4 Gain (40.0Hz) (*2)	-15.0...15.0dB
00 00 19	22 - 5E	Ach EQ Band5 Gain (50.0Hz) (*2)	-15.0...15.0dB
00 00 1A	22 - 5E	Ach EQ Band6 Gain (63.0Hz) (*2)	-15.0...15.0dB
00 00 1B	22 - 5E	Ach EQ Band7 Gain (80.0Hz) (*2)	-15.0...15.0dB
00 00 1C	22 - 5E	Ach EQ Band8 Gain (100Hz) (*2)	-15.0...15.0dB
00 00 1D	22 - 5E	Ach EQ Band9 Gain (125Hz) (*2)	-15.0...15.0dB
00 00 1E	22 - 5E	Ach EQ Band10 Gain (160Hz) (*2)	-15.0...15.0dB
00 00 1F	22 - 5E	Ach EQ Band11 Gain (200Hz) (*2)	-15.0...15.0dB
00 00 20	22 - 5E	Ach EQ Band12 Gain (250Hz) (*2)	-15.0...15.0dB
00 00 21	22 - 5E	Ach EQ Band13 Gain (315Hz) (*2)	-15.0...15.0dB
00 00 22	22 - 5E	Ach EQ Band14 Gain (400Hz) (*2)	-15.0...15.0dB
00 00 23	22 - 5E	Ach EQ Band15 Gain (500Hz) (*2)	-15.0...15.0dB
00 00 24	22 - 5E	Ach EQ Band16 Gain (630Hz) (*2)	-15.0...15.0dB

00 00 25	22 - 5E	Ach EQ Band17 Gain (800Hz) (*2)	-15.0...15.0dB
00 00 26	22 - 5E	Ach EQ Band18 Gain (1.00kHz) (*2)	-15.0...15.0dB
00 00 27	22 - 5E	Ach EQ Band19 Gain (1.25kHz) (*2)	-15.0...15.0dB
00 00 28	22 - 5E	Ach EQ Band20 Gain (1.60kHz) (*2)	-15.0...15.0dB
00 00 29	22 - 5E	Ach EQ Band21 Gain (2.00kHz) (*2)	15.0...15.0dB
00 00 2A	22 - 5E	Ach EQ Band22 Gain (2.50kHz) (*2)	-15.0...15.0dB
00 00 2B	22 - 5E	Ach EQ Band23 Gain (3.15kHz) (*2)	-15.0...15.0dB
00 00 2C	22 - 5E	Ach EQ Band24 Gain (4.00kHz) (*2)	-15.0...15.0dB
00 00 2D	22 - 5E	Ach EQ Band25 Gain (5.00kHz) (*2)	-15.0...15.0dB
00 00 2E	22 - 5E	Ach EQ Band26 Gain (6.30kHz) (*2)	-15.0...15.0dB
00 00 2F	22 - 5E	Ach EQ Band27 Gain (8.00kHz) (*2)	-15.0...15.0dB
00 00 30	22 - 5E	Ach EQ Band28 Gain (10.0kHz) (*2)	-15.0...15.0dB
00 00 31	22 - 5E	Ach EQ Band29 Gain (12.5kHz) (*2)	-15.0...15.0dB
00 00 32	22 - 5E	Ach EQ Band30 Gain (16.0kHz) (*2)	-15.0...15.0dB
00 00 33	22 - 5E	Ach EQ Band31 Gain (20.0kHz) (*2)	-15.0...15.0dB
00 00 34	04 - 5E	Ach EQ Output Level (*2)	-30.0...15.0dB
00 00 35	03 - 54	Bch Bass Cut Frequency (*1)	Thru/20.0...2.00kHz
00 00 36	04 - 5E	Bch EQ Input Level (*2)	-30.0...15.0dB
00 00 37	22 - 5E	Bch EQ Band1 Gain (20.0Hz) (*2)	-15.0...15.0dB
00 00 38	22 - 5E	Bch EQ Band2 Gain (25.0Hz) (*2)	-15.0...15.0dB
00 00 39	22 - 5E	Bch EQ Band3 Gain (31.5Hz) (*2)	-15.0...15.0dB
00 00 3A	22 - 5E	Bch EQ Band4 Gain (40.0Hz) (*2)	-15.0...15.0dB
00 00 3B	22 - 5E	Bch EQ Band5 Gain (50.0Hz) (*2)	-15.0...15.0dB
00 00 3C	22 - 5E	Bch EQ Band6 Gain (63.0Hz) (*2)	-15.0...15.0dB
00 00 3D	22 - 5E	Bch EQ Band7 Gain (80.0Hz) (*2)	-15.0...15.0dB
00 00 3E	22 - 5E	Bch EQ Band8 Gain (100Hz) (*2)	-15.0...15.0dB
00 00 3F	22 - 5E	Bch EQ Band9 Gain (125Hz) (*2)	-15.0...15.0dB
00 00 40	22 - 5E	Bch EQ Band10 Gain (160Hz) (*2)	-15.0...15.0dB
00 00 41	22 - 5E	Bch EQ Band11 Gain (200Hz) (*2)	-15.0...15.0dB
00 00 42	22 - 5E	Bch EQ Band12 Gain (250Hz) (*2)	-15.0...15.0dB
00 00 43	22 - 5E	Bch EQ Band13 Gain (315Hz) (*2)	-15.0...15.0dB
00 00 44	22 - 5E	Bch EQ Band14 Gain (400Hz) (*2)	-15.0...15.0dB
00 00 45	22 - 5E	Bch EQ Band15 Gain (500Hz) (*2)	-15.0...15.0dB
00 00 46	22 - 5E	Bch EQ Band16 Gain (630Hz) (*2)	-15.0...15.0dB
00 00 47	22 - 5E	Bch EQ Band17 Gain (800Hz) (*2)	-15.0...15.0dB
00 00 48	22 - 5E	Bch EQ Band18 Gain (1.00kHz) (*2)	-15.0...15.0dB
00 00 49	22 - 5E	Bch EQ Band19 Gain (1.25kHz) (*2)	-15.0...15.0dB
00 00 4A	22 - 5E	Bch EQ Band20 Gain (1.60kHz) (*2)	15.0...15.0dB
00 00 4B	22 - 5E	Bch EQ Band21 Gain (2.00kHz) (*2)	-15.0...15.0dB
00 00 4C	22 - 5E	Bch EQ Band22 Gain (2.50kHz) (*2)	-15.0...15.0dB

00 00 4D	22 - 5E	Bch EQ Band23 Gain (3.15kHz) (*2)	-15.0,,15.0dB
00 00 4E	22 - 5E	Bch EQ Band24 Gain (4.00kHz) (*2)	-15.0,,15.0dB
00 00 4F	22 - 5E	Bch EQ Band25 Gain (5.00kHz) (*2)	-15.0,,15.0dB
00 00 50	22 - 5E	Bch EQ Band26 Gain (6.30kHz) (*2)	-15.0,,15.0dB
00 00 51	22 - 5E	Bch EQ Band27 Gain (8.00kHz) (*2)	-15.0,,15.0dB
00 00 52	22 - 5E	Bch EQ Band28 Gain (10.0kHz) (*2)	-15.0,,15.0dB
00 00 53	22 - 5E	Bch EQ Band29 Gain (12.5kHz) (*2)	-15.0,,15.0dB
00 00 54	22 - 5E	Bch EQ Band30 Gain (16.0kHz) (*2)	-15.0,,15.0dB
00 00 55	22 - 5E	Bch EQ Band31 Gain (20.0kHz) (*2)	-15.0,,15.0dB
00 00 56	04 - 5E	Bch EQ Output Level (*2)	-30.0,,15.0dB
00 00 57	00	(Reserved)	
:	:		
00 00 7F	00		

00 00 25	00 - 0D	Compressor High Ratio (*4)	1:1.0,,1:INF
00 00 26	00 - 64	Compressor Low Attack	0,,100ms
00 00 27	00 - 64	Compressor High Attack	0,,100ms
00 00 28	00 - 64	Compressor Low Release (*5)	50,,5000ms
00 00 29	00 - 64	Compressor High Release (*5)	50,,5000ms
00 00 2A	00 - 56	Mixer Low Level (0dB:80[50H])	-80,,6dB
00 00 2B	00 - 56	Mixer High Level (0dB:80[50H])	-80,,6dB
00 00 2C	38 - 50	Limiter Threshold (0dB:80[50H])	-24,,0dB
00 00 2D	00 - 64	Limiter Attack	0,,100ms
00 00 2E	00 - 64	Limiter Release (*5)	50,,5000ms
00 00 2F	00 - 56	Output Level (0dB:80[50H])	-80,,6dB
00 00 30	00 - 01	Output Soft Clip	0,1 = Off,On
00 00 31	00	(Reserved)	
:	:		
00 00 7F	00		

\* When Link SW = On, Bch corresponds to Ach.

(\*1) See "MIDI Data - Mixer EQ Freq Table."

(\*2) See "MIDI Data - Mixer EQ Gain Table."

(\*1) See "MIDI Data - Mixer EQ Freq Table."

(\*4) See "MIDI Data - EXP/CMP Ratio Table."

(\*5) Time (ms) = 50.0 x pow (100.0, Data/100.0)

Algorithm 38 Stereo 2Band Dynamics

00 00 0E	00 - 01	Bass Cut SW	0,1 = Off,On
00 00 0F	00 - 01	Enhancer SW	0,1 = Off,On
00 00 10	00 - 01	Expander SW	0,1 = Off,On
00 00 11	00 - 01	Compressor SW	0,1 = Off,On
00 00 12	00 - 02	Limiter SW	0,1 = Off,On
00 00 13	03 - 54	Bass Cut Frequency (*1)	Thru/20.0,,2.00kHz
00 00 14	00 - 54	Enhancer Sens	0,,100
00 00 15	48 - 70	Enhancer Frequency (*1)	1.0k,,10.0kHz
00 00 16	38 - 5C	Enhancer Mix Level (0dB:80[50H])	-24,,12dB
00 00 17	38 - 5C	Input Gain (0dB:80[50H])	-24,,12dB
00 00 18	00 - 0A	Input Detect Time	0,,10ms
00 00 19	04 - 78	Input Split Point (*1)	20.0,,16.0kHz
00 00 1A	00 - 50	Expander Low Threshold (0dB:80[50H])	-80,,0dB
00 00 1B	00 - 50	Expander High Threshold (0dB:80[50H])	-80,,0dB
00 00 1C	00 - 0D	Expander Low Ratio (*4)	1:1.0,,1:INF
00 00 1D	00 - 0D	Expander High Ratio (*4)	1:1.0,,1:INF
00 00 1E	00 - 64	Expander Low Attack	0,,100ms
00 00 1F	00 - 64	Expander High Attack	0,,100ms
00 00 20	00 - 64	Expander Low Release (*5)	50,,5000ms
00 00 21	00 - 64	Expander High Release (*5)	50,,5000ms
00 00 22	38 - 50	Compressor Low Threshold (0dB:80[50H])	-24,,0dB
00 00 23	38 - 50	Compressor High Threshold (0dB:80[50H])	-24,,0dB
00 00 24	00 - 0D	Compressor Low Ratio (*4)	1:1.0,,1:INF

Algorithm 39 Dual Mono Dynamics

00 00 0E	00 - 01	Link SW	0,1 = Off,On
00 00 0F	00 - 01	Ach Bass Cut SW	0,1 = Off,On
00 00 10	00 - 01	Ach Enhancer SW	0,1 = Off,On
00 00 11	00 - 01	Ach Expander SW	0,1 = Off,On
00 00 12	00 - 01	Ach Compressor SW	0,1 = Off,On
00 00 13	00 - 01	Ach Limiter SW	0,1 = Off,On
00 00 14	00 - 01	Bch Bass Cut SW	0,1 = Off,On
00 00 15	00 - 01	Bch Enhancer SW	0,1 = Off,On
00 00 16	00 - 01	Bch Expander SW	0,1 = Off,On
00 00 17	00 - 01	Bch Compressor SW	0,1 = Off,On
00 00 18	00 - 01	Bch Limiter SW	0,1 = Off,On
00 00 19	03 - 54	Ach Bass Cut Frequency (*1)	Thru/20.0,,2.00kHz
00 00 1A	00 - 64	Ach Enhancer Sens	0,,100
00 00 1B	48 - 70	Ach Enhancer Frequency (*1)	1.0k,,10.0kHz
00 00 1C	38 - 5C	Ach Enhancer Mix Level (0dB:80[50H])	-24,,12dB
00 00 1D	38 - 5C	Ach Input Gain (0dB:80[50H])	-24,,12dB
00 00 1E	00 - 0A	Ach Input Detect Time	0,,10ms
00 00 1F	00 - 02	Ach Input Detect Point	Ach,Bch,A+B
00 00 20	00 - 50	Ach Expander Threshold (0dB:80[50H])	-80,,0dB
00 00 21	00 - 0D	Ach Expander Ratio (*4)	1:1.0,,1:INF
00 00 22	00 - 64	Ach Expander Attack	0,,100ms
00 00 23	00 - 64	Ach Expander Release (*5)	50,,5000ms

# MIDI Implementation

00 00 24	38 - 50	Ach Compressor Threshold (0dB:80[50H])	-24...0dB
00 00 25	00 - 0D	Ach Compressor Ratio (*4)	1:1.0...1:INF
00 00 26	00 - 64	Ach Compressor Attack	0...100ms
00 00 27	00 - 64	Ach Compressor Release (*5)	50...500ms
00 00 28	00 - 56	Ach Compressor Level (0dB:80[50H])	-80...6dB
00 00 29	38 - 50	Ach Limiter Threshold (0dB:80[50H])	-24...0dB
00 00 2A	00 - 64	Ach Limiter Attack	0...100ms
00 00 2B	00 - 64	Ach Limiter Release (*5)	50...500ms
00 00 2C	00 - 56	Ach Output Level (0dB:80[50H])	-80...6dB
00 00 2D	00 - 01	Ach Output Soft Clip	0.1 = Off, On
00 00 2E	03 - 54	Bch Bass Cut Frequency (*1) Thru/20.0...2.00kHz	
00 00 2F	00 - 64	Bch Enhancer Sens	0...100
00 00 30	48 - 70	Bch Enhancer Frequency (*1)	1.0k...10.0kHz
00 00 31	38 - 5C	Bch Enhancer Mix Level (0dB:80[50H])	-24...12dB
00 00 32	38 - 5C	Bch Input Gain (0dB:80[50H])	-24...12dB
00 00 33	00 - 0A	Bch Input Detect Time	0...10ms
00 00 34	00 - 02	Bch Input Detect Point	Ach, Bch, A+B
00 00 35	00 - 50	Bch Expander Threshold (0dB:80[50H])	-80...0dB
00 00 36	00 - 0D	Bch Expander Ratio (*4)	1:1.0...1:INF
00 00 37	00 - 64	Bch Expander Attack	0...100ms
00 00 38	00 - 64	Bch Expander Release (*5)	50...500ms
00 00 39	38 - 50	Bch Compressor Threshold (0dB:80[50H])	-24...0dB
00 00 3A	00 - 0D	Bch Compressor Ratio (*4)	1:1.0...1:INF
00 00 3B	00 - 64	Bch Compressor Attack	0...100ms
00 00 3C	00 - 64	Bch Compressor Release (*5)	50...500ms
00 00 3D	00 - 56	Bch Compressor Level (0dB:80[50H])	-80...6dB
00 00 3E	38 - 50	Bch Limiter Threshold (0dB:80[50H])	-24...0dB
00 00 3F	00 - 64	Bch Limiter Attack	0...100ms
00 00 40	00 - 64	Bch Limiter Release (*5)	50...500ms
00 00 41	00 - 56	Bch Output Level (0dB:80[50H])	-80...6dB
00 00 42	00 - 01	Bch Output Soft Clip	0.1 = Off, On
00 00 43	00	(Reserved)	
:	:		
00 00 7F	00		

\* When Link SW = On, Bch corresponds to Ach.

(\*1) See "MIDI Data - Mixer EQ Freq Table."

(\*4) See "MIDI Data - EXP/CMP Ratio Table."

(\*5) Time (ms) = 50.0 X pow (100.0, Data/100.0)

## Master Effect Algorithm 0 Speaker Modeling

(See "Algorithm 35 Speaker Modeling.")

## Master Effect Algorithm 1 10Band Parametric Equalizer

00 00 0E	00 - 01	Bass Cut SW	0.1 = Off, On
00 00 0F	00 - 01	EQ SW	0.1 = Off, On
00 00 10	00 - 01	Expander SW	0.1 = Off, On
00 00 11	00 - 01	Compressor SW	0.1 = Off, On
00 00 12	03 - 54	Bass Cut Frequency (*1) Thru/20.0...2.00kHz	
00 00 13	04 - 5E	EQ Input Level (*2)	-30.0...15.0dB
00 00 14	22 - 5E	EQ Band1 Gain (*2)	-15.0...15.0dB
00 00 15	04 - 7C	EQ Band1 Frequency (*1)	20.0...20.0kHz
00 00 16	00 - 21	EQ Band1 Q (*3)	0.355...16.0
00 00 17	22 - 5E	EQ Band2 Gain (*2)	-15.0...15.0dB
00 00 18	04 - 7C	EQ Band2 Frequency (*1)	20.0...20.0kHz
00 00 19	00 - 21	EQ Band2 Q (*3)	0.355...16.0
00 00 1A	22 - 5E	EQ Band3 Gain (*2)	-15.0...15.0dB
00 00 1B	04 - 7C	EQ Band3 Frequency (*1)	20.0...20.0kHz
00 00 1C	00 - 21	EQ Band3 Q (*3)	0.355...16.0
00 00 1D	22 - 5E	EQ Band4 Gain (*2)	-15.0...15.0dB
00 00 1E	04 - 7C	EQ Band4 Frequency (*1)	20.0...20.0kHz
00 00 1F	00 - 21	EQ Band4 Q (*3)	0.355...16.0
00 00 20	22 - 5E	EQ Band5 Gain (*2)	-15.0...15.0dB
00 00 21	04 - 7C	EQ Band5 Frequency (*1)	20.0...20.0kHz
00 00 22	00 - 21	EQ Band5 Q (*3)	0.355...16.0
00 00 23	22 - 5E	EQ Band6 Gain (*2)	-15.0...15.0dB
00 00 24	04 - 7C	EQ Band6 Frequency (*1)	20.0...20.0kHz
00 00 25	00 - 21	EQ Band6 Q (*3)	0.355...16.0
00 00 26	22 - 5E	EQ Band7 Gain (*2)	-15.0...15.0dB
00 00 27	04 - 7C	EQ Band7 Frequency (*1)	20.0...20.0kHz
00 00 28	00 - 21	EQ Band7 Q (*3)	0.355...16.0
00 00 29	22 - 5E	EQ Band8 Gain (*2)	-15.0...15.0dB
00 00 2A	04 - 7C	EQ Band8 Frequency (*1)	20.0...20.0kHz
00 00 2B	00 - 21	EQ Band8 Q (*3)	0.355...16.0
00 00 2C	22 - 5E	EQ Band9 Gain (*2)	-15.0...15.0dB
00 00 2D	04 - 7C	EQ Band9 Frequency (*1)	20.0...20.0kHz
00 00 2E	00 - 21	EQ Band9 Q (*3)	0.355...16.0
00 00 2F	22 - 5E	EQ Band10 Gain (*2)	-15.0...15.0dB
00 00 30	04 - 7C	EQ Band10 Frequency (*1)	20.0...20.0kHz
00 00 31	00 - 21	EQ Band10 Q (*3)	0.355...16.0
00 00 32	04 - 5E	EQ Output Level (*2)	-30.0...15.0dB
00 00 33	00 - 50	Expander Threshold (0dB:80[50H])	-80...0dB

00 00 34	00 - 0D	Expander Ratio (*4)	1:1.0...1:INF
00 00 35	00 - 64	Expander Attack	0...100ms
00 00 36	00 - 64	Expander Release (*5)	50...500ms
00 00 37	38 - 50	Compressor Threshold (0dB:80[50H])	-24...0dB
00 00 38	00 - 0D	Compressor Ratio (*4)	1:1.0...1:INF
00 00 39	00 - 64	Compressor Attack	0...100ms
00 00 3A	00 - 64	Compressor Release (*5)	50...500ms
00 00 3B	00 - 56	Compressor Level (0dB:80[50H])	-80...6dB
00 00 3C	00	(Reserved)	
00 00 7F	00		

00 00 27	00 - 64	Compressor Low Attack	0...100ms
00 00 28	00 - 64	Compressor Mid Attack	0...100ms
00 00 29	00 - 64	Compressor High Attack	0...100ms
00 00 2A	00 - 64	Compressor Low Release (*5)	50...500ms
00 00 2B	00 - 64	Compressor Mid Release (*5)	50...500ms
00 00 2C	00 - 64	Compressor High Release (*5)	50...500ms
00 00 2D	00 - 56	Mixer Low Level (0dB:80[50H])	-80...6dB
00 00 2E	00 - 56	Mixer Mid Level (0dB:80[50H])	-80...6dB
00 00 2F	00 - 56	Mixer High Level (0dB:80[50H])	-80...6dB
00 00 30	38 - 50	Limiter Threshold (0dB:80[50H])	-24...0dB
00 00 31	00 - 64	Limiter Attack	0...100ms
00 00 32	00 - 64	Limiter Release (*5)	50...500ms
00 00 33	00 - 56	Output Level (0dB:80[50H])	-80...6dB
00 00 34	00 - 01	Output Soft Clip	0,1 = Off, On
00 00 35	00	(Reserved)	
00 00 7F	00		

- (\*1) See "MIDI Data - Mixer EQ Freq Table."
- (\*2) See "MIDI Data - Mixer EQ Gain Table."
- (\*3) See "MIDI Data - Mixer EQ Quality Table."
- (\*4) See "MIDI Data - EXP/CMP Ratio Table."
- (\*5) Time (ms) = 50.0 X pow (100.0, Data/100.0)

Master Effect Algorithm 2 3Band Dynamics

00 00 0E	00 - 01	Expander SW	0,1 = Off, On
00 00 0F	00 - 01	Compressor SW	0,1 = Off, On
00 00 10	00 - 01	Limiter SW	0,1 = Off, On
00 00 11	38 - 5C	Input Gain (0dB:80[50H])	-24...12dB
00 00 12	00 - 0A	Input Detect Time	0...10ms
00 00 13	04 - 44	Input Low Split Point (*1)	20.0...800Hz
00 00 14	50 - 78	Input High Split Point (*1)	1.6k...16.0kHz
00 00 15	00 - 50	Expander Low Threshold (0dB:80[50H])	-80...0dB
00 00 16	00 - 50	Expander Mid Threshold (0dB:80[50H])	-80...0dB
00 00 17	00 - 50	Expander High Threshold (0dB:80[50H])	-80...0dB
00 00 18	00 - 0D	Expander Low Ratio (*4)	1:1.0...1:INF
00 00 19	00 - 0D	Expander Mid Ratio (*4)	1:1.0...1:INF
00 00 1A	00 - 0D	Expander High Ratio (*4)	1:1.0...1:INF
00 00 1B	00 - 64	Expander Low Attack	0...100ms
00 00 1C	00 - 64	Expander Mid Attack	0...100ms
00 00 1D	00 - 64	Expander High Attack	0...100ms
00 00 1E	00 - 64	Expander Low Release (*5)	50...500ms
00 00 1F	00 - 64	Expander Mid Release (*5)	50...500ms
00 00 20	00 - 64	Expander High Release (*5)	50...500ms
00 00 21	38 - 50	Compressor Low Threshold (0dB:80[50H])	-24...0dB
00 00 22	38 - 50	Compressor Mid Threshold (0dB:80[50H])	-24...0dB
00 00 23	38 - 50	Compressor High Threshold (0dB:80[50H])	-24...0dB
00 00 24	00 - 0D	Compressor Low Ratio (*4)	1:1.0...1:INF
00 00 25	00 - 0D	Compressor Mid Ratio (*4)	1:1.0...1:INF
00 00 26	00 - 0D	Compressor High Ratio (*4)	1:1.0...1:INF

- (\*1) See "MIDI Data - Mixer EQ Freq Table."
- (\*4) See "MIDI Data - EXP/CMP Ratio Table."
- (\*5) Time (ms) = 50.0 X pow (100.0, Data/100.0)

(\* ) The address with "#" is invalid. Data Request (RQ1) or Data Set (DT1) must be transmitted the valid size to the valid address without #.

### 3. MIDI Machine Control

#### ■MIDI Machine Control Details

##### ●STOP (MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 01H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
01H	STOP (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 stops immediately.

When "MIDI MMC Tx Switch" of VM-C7200/C7100 is set to "On," if the transport switch [STOP] was pressed, the VM-C7200/C7100 transmits as the device ID 7FH.

##### ●PLAY (MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 02H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
02H	PLAY (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-7200/7100 goes into the playback condition. The VM-C7200/C7100 does not transmit this message.

# MIDI Implementation

## ●DEFERRED PLAY (MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 03H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
03H	DEFERRED PLAY(MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 goes into the playback condition after the locate operation. When "MIDI MMC Tx Switch" of VM-C7200/C7100 is set to "On," if the transport switch [PLAY] was pressed, the VM-C7200/C7100 transmits as the device ID 7FH.

## ●FAST FORWARD (MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 04H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
04H	FAST FORWARD (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 goes into the fast forward condition. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if the transport switch [FF] was pressed, the VM-C7200/C7100 transmits as the device ID 7FH.

## ●REWIND(MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 05H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
05H	REWIND (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 goes into the rewind condition. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if the transport switch [REW] was pressed, the VM-C7200/C7100 transmits as the device ID 7FH.

## ●RECORD STROBE

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 06H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
06H	RECORD STROBE
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 goes into the recording condition. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if the transport switch [REC] was pressed out of the recording condition, the VM-C7200/C7100 transmits as the device ID 7FH.

## ●RECORD EXIT

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 07H	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
07H	RECORD EXIT
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 exits from the record condition. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if the transport switch [REC] was pressed while recording, the VM-C7200/C7100 transmits as the device ID 7FH.

## ●MMC RESET

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 0DH	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
0DH	MMC RESEI
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 resets all communication channels related with MMC. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if powered on the VM-C7200/C7100 transmits as the device ID 7FH.

## ●WRITE

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 40H, ccH, ddH, eeH, ffH...	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
40H	WRITE
ccH	Information Bytes follows the command
ddH	The name of the writable Information Field
eeH	Information Field Format
:	:
ffH	Field names and data
:	:
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 writes the data to the specified information field. The VM-C7200/C7100 does not transmit the message.

## ●MASKED WRITE

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 41H, 04H, ddH, eeH, ffH, ggH	F7H

Byte	Description
F0H	Exclusive Status
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID (or 7FH)
06H	MMC Command Message
41H	MASKED WRITE
04H	Number of Bytes follows the command
ddH	The name of the masked type writable Information Field
eeH	Byte number to write in the Bit Map
ffH	Bit location of the bit map byte to change
ggH	New data to write to the specified bit map byte
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 writes the data to the specified bit map byte. The VM-C7200/C7100 does not transmit the message.

●LOCATE (MCP)

Format 1 - LOCATE [VF]

Status	Data Byte	Status
F0H	7FH, Dev. 06H, 44H, 02H, 00H, nnH	F7H
Byte	Description	
F0H	Exclusive Status	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID (or 7FH)	
06H	MMC Command Message	
44H	LOCATE(MCP)	
02H	Number of Bytes	
00H	"I/F" sub command	
nnH	Information Field (08H, 09H, 0AH, 0BH, 0CH, 0DH, 0EH, 0FH)	
F7H	EOX (End of System Exclusive Message)	

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 locates the selected time location stored to the specified information field. The VM-C7200/C7100 does not transmit the message.

Format 2 - LOCATE (TARGET)

Status	Data Byte	Status
F0H	7FH, Dev. 06H, 44H, 06H, 01H, hrH, mnH, scH, frH, ffH	F7H
Byte	Description	
F0H	Exclusive Status	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID (or 7FH)	
06H	MMC Command Message	
44H	LOCATE(MCP)	
06H	Number of Bytes	
01H	"TARGET" sub command	
hrH, mnH, scH, frH, ffH	Standard Time with Sub Frame	
F7H	EOX (End of System Exclusive Message)	

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 locates the specified time location received from the command. When "MIDI MMC Tx Switch" of the VM-C7200/C7100 is set to "On," if the efficient locate switch [LOC?] or Marker switch [PREVIOUS] or [NEXT] is pressed, the VM-C7200/C7100 transmits as the device ID 7FH.

●MOVE

Status	Data Byte	Status
F0H	7FH, Dev. 06H, 4CH, 02H, ddH, ssH	F7H
Byte	Description	
F0H	Exclusive Status	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID (or 7FH)	
06H	MMC Command Message	
4CH	MOVE	
02H	Number of Bytes	
ddH	Name of the Efficient Destination Information Field (08H, 09H, 0AH, 0BH, 0CH, 0DH, 0EH, 0FH)	
ssH	Name of the Efficient Source Information Field(01H)	
F7H	EOX (End of System Exclusive Message)	

If the device ID on the message was as same as that of the receiving device or 7FH, the VM-C7200/C7100 transfers the data on the selected source information field to the destination Information Field, if the name of both information fields is efficient. The VM-C7200/C7100 does not transmit the message.

4. Appendices

●Decimal and Hexadecimal table

(Hexadecimal number is shown with H.)

In MIDI documentation, data values and addresses/sizes of system exclusive messages etc. are expressed as hexadecimal values for each 7 bits. The following table shows how these correspond to decimal numbers.

dec	hex	dec	hex	dec	hex	dec	hex
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

- Decimal values such as MIDI channel, bank select, and program change are listed as one (1) greater than the values given in the above table.
- A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128 + bb.
- In the case of values which have a +/- sign, 00H = -64, 40H = +/-0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = +/-0, and 7F 7FH = +8191.
- Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a x 16 + b.

<Ex.1> What is 5AH in decimal system?  
5AH = 90 according to the above table.

<Ex.2>What in decimal system is 12034H in hexadecimal of every 7 bit?  
12H = 18, 34H = 52 according to the above table. So 18 x 128 + 52 = 2356.

<Ex.3> What in decimal system is 0A 03 09 0D in nibble system?  
0AH = 10, 03H = 3, 09H = 9, 0DH = 13 according to the table.  
So ((10 x 16 + 3) x 16 + 9) x 16 + 13 = 41885.

<Ex. 4> What in nibble system is 1258 in decimal system?

```

16) 1258
   78 ... 10
   16)  4 ... 14
     0 ...  4
    
```

0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH According to the table.  
So it is 00 04 0E 0AH.

## MIDI Implementation

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### ● Example of system exclusive message and Checksum calculation

On Roland system exclusive message (DT1), checksum is added at the end of transmitted data (in front of F7) to check the message is received correctly. Value of checksum is defined by address and data (or size) of the system exclusive message to be transmitted.

#### How to calculate checksum (Hexadecimal number is shown with H.)

Checksum is a value which lower 7 bit of the sum of address, size and checksum itself turns to be 0.

If the address of the system exclusive message to be transmitted is aa bb ccH and data or size is dd ee ffH,

$aa + bb + cc + dd + ee + ff = \text{sum}$

$\text{sum} / 128 = \text{quotient and odd}$

When odd is 0, 0 = checksum

When odd is other than 0,  $128 - \text{odd} = \text{checksum}$

### ■ MIDI Machine Control (MMC) Command, Information field / Response Reference

#### ● Command Recognized

<u>Command</u>	<u>Action</u>
01H STOP	STOP
02H PLAY	PLAY
03H DEFERRED PLAY	PLAY
04H FAST FORWARD	FF
05H REWIND	REW
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
40H WRITE	Write Information Fields
41H MASKED WRITE	Set Track Status Information Fields
44H 00H LOCATE 1/F	LOCATE (Read locator)
44H 01H LOCATE TARGET	LOCATE (Designated Time)
4CH MOVE	Move between Information Fields

#### ● Commands Transmitted

<u>Command</u>	<u>Action</u>
01H STOP	STOP
03H DEFERRED PLAY	PLAY
04H FAST FORWARD	FF
05H REWIND	REW
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
44H 01H LOCATE TARGET	LOCATE

#### ● Valid Information Fields / Response

<u>Information Field</u>	<u>Interpret</u>	<u>Valid Commands</u>
01H SELECTED TIME CODE	Current Time	MOVE(FROM)
08H GP1 / LOCATE POINT	Locator 1	MOVE(FROM), MOVE(TO), WRITE
09H GP1	Locator 2	MOVE (FROM), MOVE (TO), WRITE
0AH GP2	Locator 3	MOVE (FROM), MOVE (TO), WRITE
0BH GP3	Locator 4	MOVE (FROM), MOVE (TO), WRITE
0CH GP4	Locator 5	MOVE (FROM), MOVE (TO), WRITE
0DH GP5	Locator 6	MOVE (FROM), MOVE (TO), WRITE
0EH GP6	Locator 7	MOVE (FROM), MOVE (TO), WRITE
0FH GP7	Locator 8	MOVE (FROM), MOVE (TO), WRITE



V-MIXING PROCESSOR

Date : Jun. 25, 1999

Model VM-7200, VM-7100

**MIDI Implementation Chart**

Version : 1.00

Function...	Transmitted	Recognized	Remarks
Basic Channel Default Changed	1-16 1-16	1-16 *****	
Mode Default Messages Altered	Mode 3 X *****	Mode 3 X X	
Note Number : True Voice	X X	X X	
Velocity Note On Note Off	X X	X X	
After Touch Key's Channel's	O *1 X	X X	
Pitch Bend	X	X	
Control Change	1-31 O *2 33-95 O *2 6, 38 O *3 96, 97 X *3 98, 99 O *3 102-119 O *2	O *2 O *2 O *3 O *3 O *3 O *2	Data Entry LSB, MSB Dat Inc, Dec NRPN LSB, MSB
Program Change : True Number	X *****	X X	
System Exclusive	O *4	O *5	
System Common : Quarter Frame : Song Position : Song Select : Tune Request	X X X X	X X X X	
System Real Time : Clock : Commands	X X	X X	
Aux Messages : All Sound Off : Reset All Controllers : Local On/Off : All Notes Off : Active Sensing : System Reset	X X X X X X	X X X X X X	
Notes	*1 The level meter value is transmitted according to the VM-7200/VM-7100's level meter value. *2 MIDI Control Type = C.C. only *3 MIDI Control Type = NRPN only *4 MIDI MMC Tx Switch (VM-C7200/C7100) = On only (MMC) *5 MMC is transmitted to the VM-Link when a VM-Link is used for the connection. When a DIF-AT is used for the connection, MMC is transmitted to the DIF-AT.		

Mode 1 : OMNI ON, POLY  
 Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO  
 Mode 4 : OMNI OFF, MONO

O : Yes  
 X : No

# Specifications

## VM-7200:48 Channel V-Mixing processor

## VM-7100:38 Channel V-Mixing processor

### Channels

48	*VM-7200
38	*VM-7100

### Signal processing

AD Conversion:	24 bits, 64 times oversampling
DA Conversion:	24 bits, 128 times oversampling
Internal Processing:	32 bits

### Sample Rate

48 kHz, 44.1 kHz, 32 kHz

### Frequency Response

48 kHz:	20 Hz – 20 kHz (-0.1 dB/+0.1 dB)
44.1 kHz:	20 Hz – 20 kHz (-0.1 dB/+0.1 dB)
32 kHz:	20 Hz – 15 kHz (-0.1 dB/+0.1 dB)

### Total Harmonic Distortion (INPUT SENS:0dBu, 1 kHz at nominal Output level)

0.05 % or less

### Nominal Input Level (variable)

Input 1 – 10, 23 – 24:	-60 – +4 dBu
Input 11 – 20:	-60 – +4 dBu *VM-7200

### Input Impedance

Input 1 – 10, 23 – 24:	10 k ohms
Input 11 – 20:	10 k ohms *VM-7200

### Nominal Output Level

Main Out:	+4 dBu
Rec Out:	-10 dBV
Assignable Out:	+4 dBu
Monitor Out:	+4 dBu *VM-7200
Flex Bus Out:	+4 dBu *VM-7200

### Output Impedance

Main Out:	600 ohms
Rec Out:	600 ohms
Assignable Out:	600 ohms
Monitor Out:	600 ohms *VM-7200
Flex Bus Out:	600 ohms *VM-7200

### Recommended Load Impedance

Main Out:	1 k ohm or greater
Rec Out:	1 k ohm or greater
Assignable Out:	1 k ohm or greater
Monitor Out:	1 k ohm or greater *VM-7200
Flex Bus Out:	1 k ohm or greater *VM-7200

### Residual Noise Level (IHF-A, Typ.)

Main Out:	-80 dBu or less
Rec Out:	-80 dBu or less
Assignable Out:	-80 dBu or less
Monitor Out:	-80 dBu or less *VM-7200
Flex Bus Out:	-80 dBu or less *VM-7200



In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.

## Connectors and Jacks

- Input Jacks 1 – 10 (XLR-type, balanced, phantom power)
- Input Jacks 1 – 10 (1/4 inch phone type, TRS balanced)
- Input Jacks 11 – 20 (XLR-type, balanced, phantom power) \*VM-7200
- Input Jacks 11 – 20 (1/4 inch phone type, TRS balanced) \*VM-7200
- Insert Jacks 1 – 6 (1/4 inch phone type, TRS)
- Insert Jacks 11 – 16 (1/4 inch phone type, TRS) \*VM-7200
- Main Out Jacks L, R (XLR-type, balanced)
- Main Out Jacks L, R (1/4 inch phone type, TRS balanced)
- Rec Out Jacks L, R (RCA phono type)
- Assignable Out Jacks 1 – 8 (1/4 inch phone type, TRS balanced)
- Monitor Out Jacks L, R (1/4 inch phone type, TRS balanced) \*VM-7200
- Flex Bus Out Connectors 7 – 12 (XLR-type, balanced) \*VM-7200
- Flex Bus Out Jacks 5 – 12 (1/4 inch phone type, TRS balanced) \*VM-7200
- Digital In Connectors (AES/EBU, Coaxial)
- Digital Out Connectors (AES/EBU, Coaxial)
- MIDI Connectors (In, Out/Thru/Meter)
- VM-LINK Connectors (In, Out) (XLR type)
- Word Clock Connectors (In, Out) (BNC type)
- **Added (enabled) when the VM-24C or VM-24E is installed.**
  - Cascade Connector (DB-25 type)
  - Digital Multi In/Out Connector 1 – 8 (R-BUS, DB-25 type)
  - Digital Multi In/Out Connector 9 – 16 (R-BUS, DB-25 type)
  - Digital Multi In/Out Connector 17 – 24 (R-BUS, DB-25 type)

## Power Supply

AC 117 V, AC 230 V or AV 240 V

## Power Consumption

65 W \*VM-7200  
 55 W \*VM-7100

## Dimensions

482 (W) X 423 (D) X 137 (H) mm  
 19 (W) X 16-11/16 (D) X 5-7/16 (H) inches

## Weight

9.4 kg \*VM-7200  
 20 lbs 12 oz. \*VM-7200  
 8.7 kg \*VM-7100  
 19 lbs 3 oz. \*VM-7100

## Accessories

AC Cord  
 Block Diagram  
 Owner's Manual

## Options

V-Mixing Console	VM-C7200/VM-C7100
Effect Expansion Board:	VS8F-2
Cascade Kit:	VM-24C
I/O Expansion Board:	VM-24E
Interface Box for adat/TASCAM:	DIF-AT
Rackmount Angle:	RO-7000

(0 dBu = 0.775 Vrms)

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**MEMO...**



This product complies with the requirements of European Directives EMC 89/336/EEC and LVD 73/23/EEC.

For EU Countries

## FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.  
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For the USA

## NOTICE

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

For Canada

## AVIS

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Information

When you need repair service, call your nearest Roland Service Center or authorized Roland distributor in your country as shown below.

### AFRICA

#### EGYPT

**Al Fanny Trading Office**  
P.O. Box 2904,  
El Horrieh Heliopolis, Cairo,  
EGYPT  
TEL: (02) 4185531

#### REUNION

**Maison FO - YAM Marcel**  
25 Rue Jules Merman ZL  
Chaudron - B179 97491  
Ste Clotilde REUNION  
TEL: 28 29 16

#### SOUTH AFRICA

**That Other Music Shop  
(PTY) Ltd.**  
11 Melle Street (Cnr Melle and  
Juta Street)  
Braamfontein 2001  
Republic of SOUTH AFRICA  
TEL: (011) 403 4105

**Paul Bothner (PTY) Ltd.**  
17 Werdmuller Centre Claremont  
7700  
Republic of SOUTH AFRICA

P.O. Box 23032  
Claremont, Cape Town  
SOUTH AFRICA, 7735  
TEL: (021) 64 4030

### ASIA

#### CHINA

**Beijing Xinghai Musical  
Instruments Co., Ltd.**  
6 Huangmichang Chao Yang  
District, Beijing, CHINA  
TEL: (010) 6774 7491

#### HONG KONG

**Tom Lee Music Co., Ltd.  
Service Division**  
22-32 Pun Shan Street, Tsuen  
Wan, New Territories,  
HONG KONG  
TEL: 2415 0911

#### INDIA

**Rivera Digitec (India) Pvt. Ltd.**  
409, Nirman Kendra Mahalaxmi  
Flats Compound Off. Dr. Edwin  
Moses Road, Mumbai-400011,  
INDIA  
TEL: (022) 498 3079

#### INDONESIA

**PT Citra Inti Rama**  
Jl. Cideng Timur No. 15J-150  
Jakarta Pusat  
INDONESIA  
TEL: (021) 6324170

#### KOREA

**Cosmos Corporation  
Service Station**  
261 2nd Floor Nak-Won Arcade  
Jong-Ro Ku, Seoul, KOREA  
TEL: (02) 742 8844

#### MALAYSIA

**Bentley Music SDN BHD**  
140 & 142, Jalan Bukit Bintang  
55100 Kuala Lumpur, MALAYSIA  
TEL: (03) 2443333

#### PHILIPPINES

**G.A. Yupangco & Co. Inc.**  
339 Gil J. Puyat Avenue  
Makati, Metro Manila 1200,  
PHILIPPINES  
TEL: (02) 899 9801

### SINGAPORE

**Sweet Lee Company**  
150 Sims Drive,  
SINGAPORE 387381  
TEL: 748-1669

### KRISTOFORI MUSIC PTE LTD

81K 3014, Bedok Industrial Park E,  
#02-2148, SINGAPORE 489980  
TEL: 243 9555

### TAIWAN

**ROLAND TAIWAN  
ENTERPRISE CO., LTD.**  
Room 5, 9th Fl. No. 112 Chung Shan  
N. Road Sec. 2, Taipei, TAIWAN,  
R.O.C.  
TEL: (02) 2561 3339

### THAILAND

**Theatra Music Co., Ltd.**  
330 Veeng Nakorn Kasem, Soi 2,  
Bangkok 10100, THAILAND  
TEL: (02) 2248821

### VIETNAM

**Saigon Music**  
138 Tran Quang Khai St.,  
District 1  
Ho Chi Minh City  
VIETNAM  
TEL: (08) 844-4068

### AUSTRALIA/ NEW ZEALAND

#### AUSTRALIA

**Roland Corporation  
Australia Pty., Ltd.**  
38 Campbell Avenue  
Dee Why West, NSW 2099  
AUSTRALIA  
TEL: (02) 9982 8266

#### NEW ZEALAND

**Roland Corporation (NZ) Ltd.**  
97 Mt. Eden Road, Mt. Eden,  
Auckland 3, NEW ZEALAND  
TEL: (09) 3098 715

### CENTRAL/LATIN AMERICA

#### ARGENTINA

**Instrumentos Musicales S.A.**  
Florida 656 2nd Floor  
Office Number 206A  
Buenos Aires  
ARGENTINA, CP1005  
TEL: (54-11) 4-393-6037

#### BRAZIL

**Roland Brasil Ltda.**  
R. Coronel Octaviano da Silveira  
203 05522-010  
Sao Paulo BRAZIL  
TEL: (011) 3743 9377

#### CHILE

**Comercial Fancy S.A.**  
Avenida Rancagua #0330  
Providencia Santiago, CHILE  
TEL: 56-2-373-9100

#### EL SALVADOR

**OMNI MUSIC**  
75 Avenida Noire y Alameda  
Juan Pablo 2 No. 4010  
San Salvador, EL SALVADOR  
TEL: (503) 262-0788

#### MEXICO

**Casa Veerkamp, s.a. de c.v.**  
Av. Toluca No. 323 Col. Olivar de  
los Padres 01780 Mexico D.F.  
MEXICO  
TEL: (5251) 668 04 80

**La Casa Wagner de  
Guadalajara s.a. de c.v.**  
Av. Corona No. 202 S.J.  
Guadalajara, Jalisco Mexico  
C.P. 44100 MEXICO  
TEL: (3) 613 1414

### PANAMA

**Productos Superiores, S.A.**  
Apartado 655 - Panama 1  
REP. DE PANAMA  
TEL: (507) 270-2300

### URUGUAY

**Todo Musica**  
Cuareim 1488, Montevideo,  
URUGUAY  
TEL: 5982-924-2335

### VENEZUELA

**Musicaland Digital C.A.**  
Av. Francisco de Miranda,  
Centro Parque de Cristal, Nivel  
C2 Local 20 Caracas  
VENEZUELA  
TEL: (02) 285 9218

### EUROPE

#### AUSTRIA

**Roland Austria GES.M.B.H.**  
Siemensstrasse 4, P.O. Box 74,  
A-6063 RUM, AUSTRIA  
TEL: (0512) 26 44 260

#### BELGIUM/HOLLAND/ LUXEMBOURG

**Roland Benelux N. V.**  
Houtstraat 3 B-2260 Oevel  
(Westerlo) BELGIUM  
TEL: (014) 575811

#### DENMARK

**Roland Scandinavia A/S**  
Nordhavnsvej 7, Postbox 888  
DK-2100 Copenhagen  
DENMARK  
TEL: (039)16 6200

#### FRANCE

**Roland France SA**  
4, Rue Paul Henri SPAAK  
Parc de l'Esplanade F 77 462 St.  
Thibault Logny Cedex FRANCE  
TEL: 01 600 73 500

#### FINLAND

**Roland Scandinavia As,  
Filial Finland**  
Lautasaarentie 54 B  
Fin-00201 Helsinki, FINLAND  
TEL: (9) 682 4020

#### GERMANY

**Roland Elektronische  
Musikinstrumente  
Handelsgesellschaft mbH.**  
Osstrasse 96, 22844 Norderstedt,  
GERMANY  
TEL: (040) 52 60090

#### GREECE

**STOLLAS S.A.**  
**Music Sound Light**  
155, New National Road  
26422 Patras, GREECE  
TEL: 061-435400

#### HUNGARY

**Intermusica Ltd.**  
Warehouse Area 'DEPO' PE83  
H-2046 Torokbalint, HUNGARY  
TEL: (23) 511011

#### IRELAND

**Roland Ireland**  
Audio House, Belmont Court,  
Donnybrook, Dublin 4,  
Republic of IRELAND  
TEL: (01) 2603501

#### ITALY

**Roland Italy S. p. A.**  
Viale delle Industrie, 8  
20020 Arese Milano, ITALY  
TEL: (02) 937-78300

#### NORWAY

**Roland Scandinavia Avd.  
Kontor Norge**  
Lilleakerveien 2 Postboks 95  
Lilleaker N-0216 Oslo  
NORWAY  
TEL: 273 0074

### POLAND

**P. P. H. Brzostowicz**  
Ul. Gibraltarska 4.  
PL-03664 Warszawa POLAND  
TEL: (022) 679 44 19

### PORTUGAL

**Tecnologias Musica e Audio,  
Roland Portugal, S.A.**  
RUA SANTA CATARINA  
131 - 4000 Porto -PORTUGAL  
TEL: (02) 208 44 56

### ROMANIA

**FBS LINES**  
Plata Libertatii 1.  
RO-1200 Cheorgheni  
TEL: (066) 164-609

### RUSSIA

**Slami Music Company**  
Sadovaya-Triumfalnaja st., 16  
103006 Moscow, RUSSIA  
TEL: 095 209 2193

### SPAIN

**Roland Electronics  
de España, S. A.**  
Calle Bolivia 239 08020 Barcelona,  
SPAIN  
TEL: (93) 308 1000

### SWEDEN

**Roland Scandinavia A/S  
SWEDISH SALES OFFICE**  
Danvik Center 28, 2 tr.  
S-131 30 Nacka SWEDEN  
TEL: (08) 702 0020

### SWITZERLAND

**Roland (Switzerland) AG  
Musitronic AG**  
Gerberstrasse 5, CH-4410 Liestal,  
SWITZERLAND  
TEL: (061) 921 1615

### UKRAINE

**TIC-TAC**  
Mira Str. 19/108  
P.O. Box 180  
295400 Munkachevo, UKRAINE  
TEL: (03131) 414-40

### UNITED KINGDOM

**Roland (U.K.) Ltd.**  
Atlantic Close, Swansea  
Enterprise Park SWANSEA  
SA7 9FJ,  
UNITED KINGDOM  
TEL: (01792) 700139

### MIDDLE EAST

#### BAHRAIN

**Moon Stores**  
Bab Al Bahrain Road,  
P.O. Box 20077  
State of BAHRAIN  
TEL: 211 005

#### CYPRUS

**Radex Sound Equipment Ltd.**  
17 Diagorou St., P.O. Box 2046,  
Nicosia CYPRUS  
TEL: (02) 453 426

#### ISRAEL

**Halilit P. Greenspoon &  
Sons Ltd.**  
8 Retzif Fa'aliya Hashnaya St.  
Tel-Aviv-Yahvo ISRAEL  
TEL: (03) 6823666

#### JORDAN

**AMMAN Trading Agency**  
Prince Mohammed St. P.O. Box  
825 Amman 11118 JORDAN  
TEL: (06) 4641200

#### KUWAIT

**Easa Husain Al-Yousifi**  
P.O. Box 126 Safat 13002  
KUWAIT  
TEL: 5719499

### LEBANON

**A. Chahine & Fils**  
P.O. Box 16-5857 Gergi Zeidan St.  
Chahine Building, Achrafieh  
Beirut, LEBANON  
TEL: (01) 335799

### OMAN

**OHI Electronics & Trading  
Co. LLC**  
P.O. Box 889 Muscat  
Sultanate of OMAN  
TEL: 959085

### QATAR

**Badie Studio & Stores**  
P.O. Box 62,  
DOHA QATAR  
TEL: 423554

### SAUDI ARABIA

**aDawlah Uniberal  
Electronics APL**  
P.O. Box 2154 ALKHOBAR 31952,  
SAUDI ARABIA  
TEL: (03) 898 2081

### SYRIA

**Technical Light & Sound  
Center**  
Khaled Ibn Al Walid St.  
P.O. Box 13520  
Damascus - SYRIA  
TEL: (011) 2235 384

### TURKEY

**Barkat Muzik aletleri ithalat  
ve ihracat limited ireketi**  
Siraselviler Cad. Billurcu Sok.  
Mucadelle Cikmeze No. 11-13  
Taksim. Istanbul, TURKEY  
TEL: (0212) 2499324

### U.A.E.

**Zak Electronics & Musical  
Instruments Co.**  
Zabed Road, Al Sheroq Bldg.,  
No. 14, Grand Floor DUBAI  
U.A.E.  
P.O. Box 8050 DUBAI, U.A.E.  
TEL: (04) 360715

### NORTH AMERICA

#### CANADA

**Roland Canada Music Ltd.  
(Head Office)**  
5480 Parkwood Way Richmond  
B. C., V6V 2M4 CANADA  
TEL: (0604) 270 6626

**Roland Canada Music Ltd.  
(Toronto Office)**  
Unit 2, 109 Woodbine Downs  
Blvd, Etobicoke, ON  
M9W 6Y1 CANADA  
TEL: (0416) 213 9707

#### U. S. A.

**Roland Corporation U.S.**  
5100 S. Eastern Avenue  
Los Angeles, CA 90040-2938,  
U. S. A.  
TEL: (323) 890 3700

As of June 11, 1999





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